

4.0 SOURCE ASSESSMENT

This section summarizes the available information on significant sources of bacteria in the six subwatersheds of the Kankakee/Iroquois River watershed. Point (or regulated) sources are presented first, followed by nonpoint (or unregulated) sources.

The term point source refers to any discernible, confined and discrete conveyance, such as a pipe, ditch, channel, tunnel or conduit, by which pollutants are transported to a waterbody. It also includes vessels or other floating craft from which pollutants are or may be discharged. By law, the term “point source” also includes: concentrated animal feeding operations (which are places where animals are confined and fed); storm water runoff from Municipal Separate Storm Sewer Systems (MS4s); and illicitly connected “straight pipe” discharges of household waste. Point sources are regulated through the National Pollutant Discharge Elimination System (NPDES).

Nonpoint sources include all other categories not classified as point sources. In urban areas, nonpoint sources can include leaking or faulty septic systems, runoff from lawn fertilizer applications, pet waste, storm water runoff (outside of MS4 communities), and other sources. In rural areas, nonpoint sources can include runoff from agricultural fields, forests, and undeveloped areas.

4.1 Upper Kankakee

This section of the report presents the available information on the sources of *E. coli* in the Upper Kankakee subwatershed.

The Upper Kankakee subwatershed lies solely in Indiana, covering nearly 663 square miles of the headwater reaches of the Kankakee River (Figure 8). The Kankakee River drains portions of St. Joseph, La Porte, Marshall, and Starke Counties. In addition to the southern suburbs of South Bend, the Upper Kankakee includes La Porte, Koontz Lake, Walkerton, North Liberty, and New Carlisle. Land use/land cover in the Upper Kankakee (Table 8) is primarily agricultural. Forested areas contribute to 17 percent of the watershed area, and approximately 10 percent of the land is developed.

The potential sources of bacteria in this subwatershed are further discussed in the following sections.

Table 8. Land Use/Land Cover in the Upper Kankakee Subwatershed

Land Use/Land Cover	Area		Percent
	Acres	Square Miles	
Agricultural Land	269,668	421	63.65
Forested Land	70,282	110	16.59
Developed Land	40,583	63	9.58
Pasture/Hay	17,202	27	4.06
Grassland and Shrubs	11,262	18	2.66
Wetland	10,056	16	2.37
Open Water	4,636	7	1.09
Total	423,690	662	100

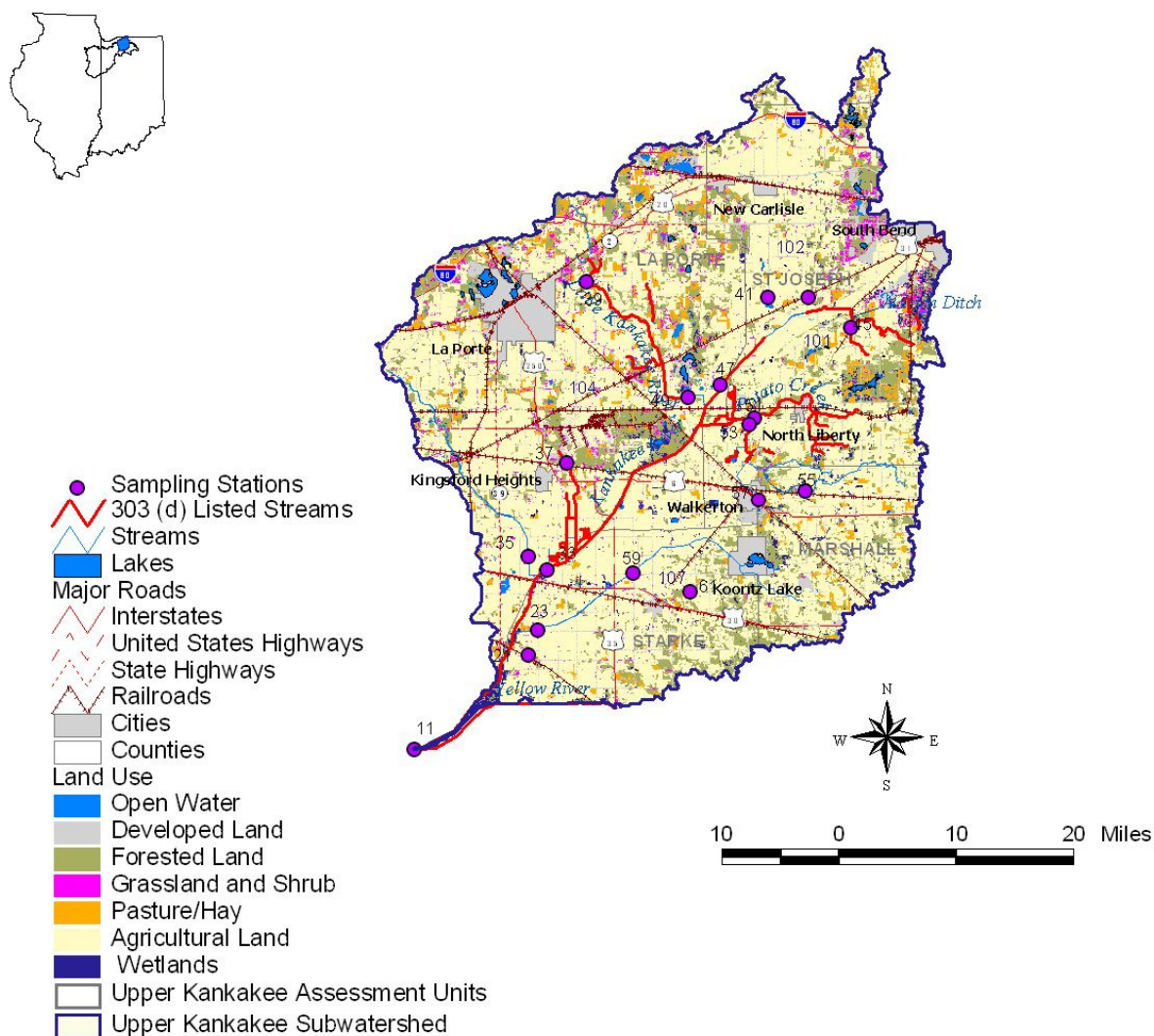


Figure 8. Land use in the Upper Kankakee Subwatershed

4.1.1 Point Sources

This section summarizes the potential point sources of bacteria in the Upper Kankakee subwatershed.

4.1.1.1 Wastewater Treatment Plants (WWTPs)

There are 10 active facilities that are permitted to discharge wastewater containing bacteria within the Upper Kankakee subwatershed (Table 9 and Figure 9). These facilities include municipal and small domestic wastewater treatment plants. In Indiana municipal and small domestic wastewater treatment plants are both regulated under municipal permits. Municipal facilities in Indiana are required to disinfect their effluent during the recreational season (April 1 to October 31). IDEM does not require disinfection for waste-stabilization lagoons as long as *E. coli* limits from their permit are met utilizing the lagoon's retention time. The total design flow¹ of the 10 active facilities is 10.8 million gallons per day (MGD).

Table 9. NPDES Facilities in the Upper Kankakee Subwatershed

HUC 10	HUC 10 Name	Permit Number	Facility Name	Receiving Stream	Average Design Flow (MGD)
712000101	Pine Creek	IN0025801	North Liberty WWTP	Kankakee R Via Pine Cr Via Potato C	0.180
		IN0052272	Potato Creek State Park	Kankakee R Via Pine Cr Via Potato C	0.093
		IN0040690	Walkerton Municipal WWTP	Kankakee R Via Pine Creek	0.364
712000102	Little Kankakee River-Kankakee River	IN0036897	New Prairie High School	Um/Kankakee River/Unnamed Swale	0.043
712000104	Mill Creek-Kankakee River	IN0045471	Kingsbury Utility Corp	Kankakee R Via Travis Ditch	2.500
		IN0023337	Kingsford Heights Municipal WWTP	Kankakee R Via Porter Ditch	0.422
		IN0025577	La Porte Municipal STP	Kankakee R Via Travis Ditch	7.000
712000107	Robbins Ditch-Kankakee River	IN0040100	Hamlet Municipal STP	Kankakee R Via Danielson Ditch	0.100
		IN0061085	Swan Lake Golf Resort	Um/Kankakee R/Lawrence Pontius D/Un	0.036
		IN0041882	Yogi Bears Jellystone Park	Um/Kankakee R/Yellow R/Bald Ditch	0.105
			Total		10.843

¹ A facility's design flow is the peak volume that it is designed and permitted to discharge.

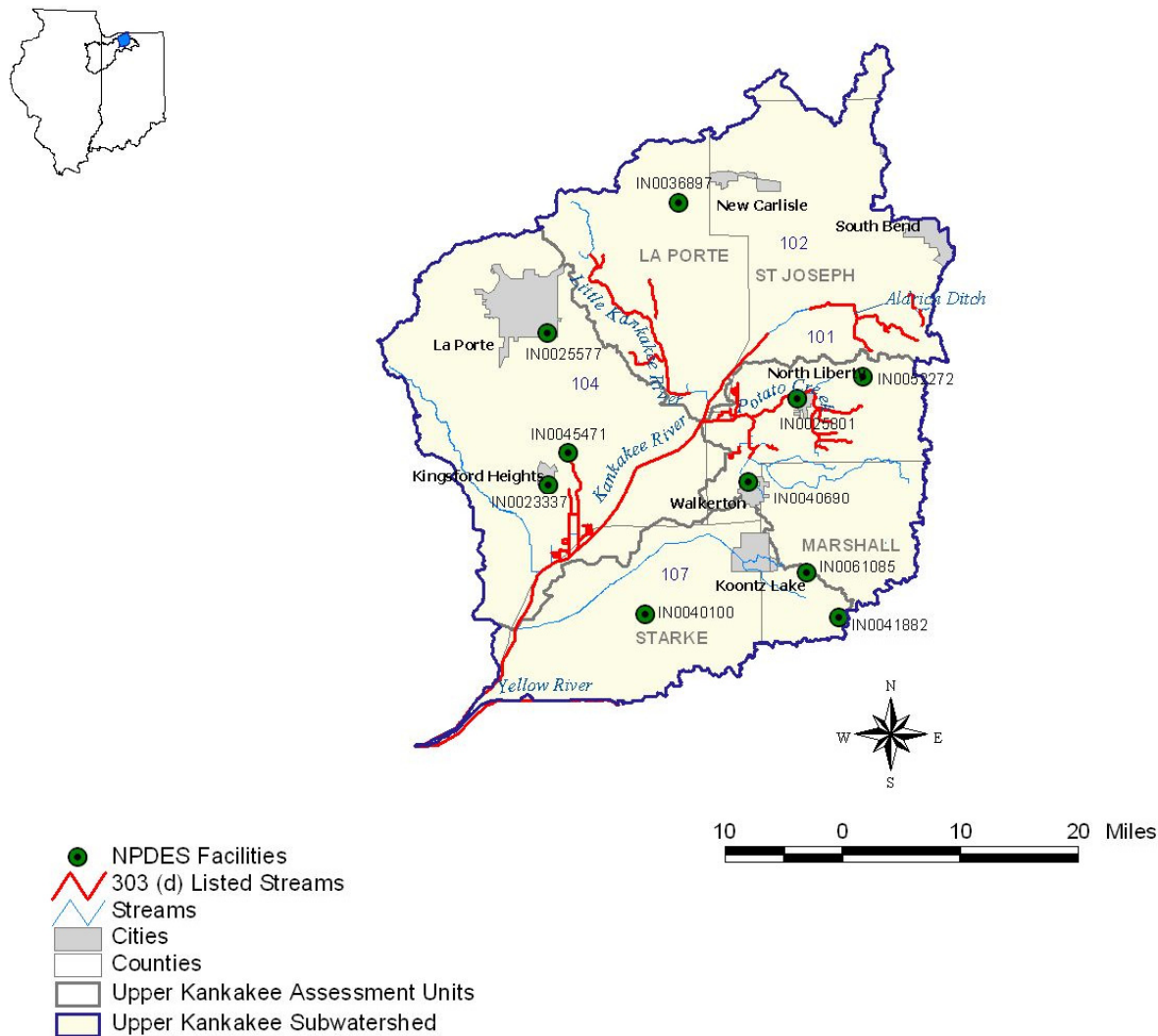


Figure 9. NPDES Facilities in the Upper Kankakee Subwatershed

4.1.1.2 Combined Sewer Overflows (CSOs)

Combined sewer systems are sewers that are designed to collect rainwater runoff, domestic sewage, and industrial wastewater into the same pipe. Most of the time, combined sewer systems transport all of their wastewater to a sewage treatment plant, where it is treated and then discharged to a waterbody. During periods of heavy rainfall or snowmelt, however, the wastewater volume in a combined sewer system can exceed the capacity of the sewer system or treatment plant. For this reason, combined sewer systems are designed to overflow occasionally and discharge excess wastewater directly to nearby streams, rivers, or other water bodies. These overflows, called combined sewer overflows (CSOs), can contain both storm water and untreated human and industrial waste. Because they are associated with wet weather events, CSOs typically discharge for short periods of time at random intervals.

There are no CSOs in the Upper Kankakee subwatershed.

4.1.1.3 **Municipal Separate Storm Sewer System (MS4)**

MS4s, generally, are public storm sewer systems (including roads with drainage systems and municipal streets) that are owned or operated by a public body and not part of a combined sewer (i.e., storm and sanitary sewers combined). MS4s can be significant sources of bacteria because they transport urban runoff that can be affected by pet waste, illicit sewer connections, failing septic systems, and other potential sources of bacteria. Regulated small MS4s are identified according to the U.S. Census Bureau definition of urbanized area as established every 10 years in its decennial census. Populations served by these regulated small MS4s range from several hundred to tens of thousands of people, but in most instances these systems serve fewer than about 30,000–50,000 people. There are two MS4 communities in the Upper Kankakee subwatershed as shown in Table 10.

Table 10. Upper Kankakee MS4 Communities

MS4 Facility Permit ID	MS4 Name	Area (Square Miles)
INR040107	La Porte County	14.9
INR040114	South Bend	3.4

4.1.1.4 **Concentrated Animal Feeding Operations (CAFOs)**

The removal and disposal of manure, litter, or processed wastewater that is generated as the result of concentrated animal feeding operations (CAFOs) is considered a point source that is regulated through the NPDES Program. Indiana regulations for CAFOs can be found in 327 IAC 15-15. In Illinois, the CAFO program is administered by the Illinois EPA through general permit number ILA01 (refer to the following Web site for more details: <http://www.epa.state.il.us/water/cafo/>). The federal regulations for all CAFOs can be found in 40 CFR Parts 9, 122, and 412 and U.S. EPA requires that CAFOs receive a WLA as part of the TMDL development process. The WLA is typically set at zero for all pollutants to be consistent with the requirement that CAFOs not discharge to waters of the state. Indiana has identified 28 CAFOs in the Kankakee/Iroquois watershed and the WLAs for each is set to zero. No CAFOs were identified by IEPA in the Illinois portion of the watershed, and so the WLA is also equal to zero.

There are three CAFOs within the Upper Kankakee subwatershed as shown in Table 11 and Figure 10.

Table 11. CAFOs in the Upper Kankakee Subwatershed

HUC 10	HUC 10 Name	NPDES ID	Operation Name
712000101	Pine Creek	ING802239	Walkerton Farm
712000102	Little Kankakee River-Kankakee River	ING806085	Scher-Way Dairy Farm
712000107	Robbins Ditch-Kankakee River	ING800149	N&L Pork, Inc. - Lee Nagai - Home Site

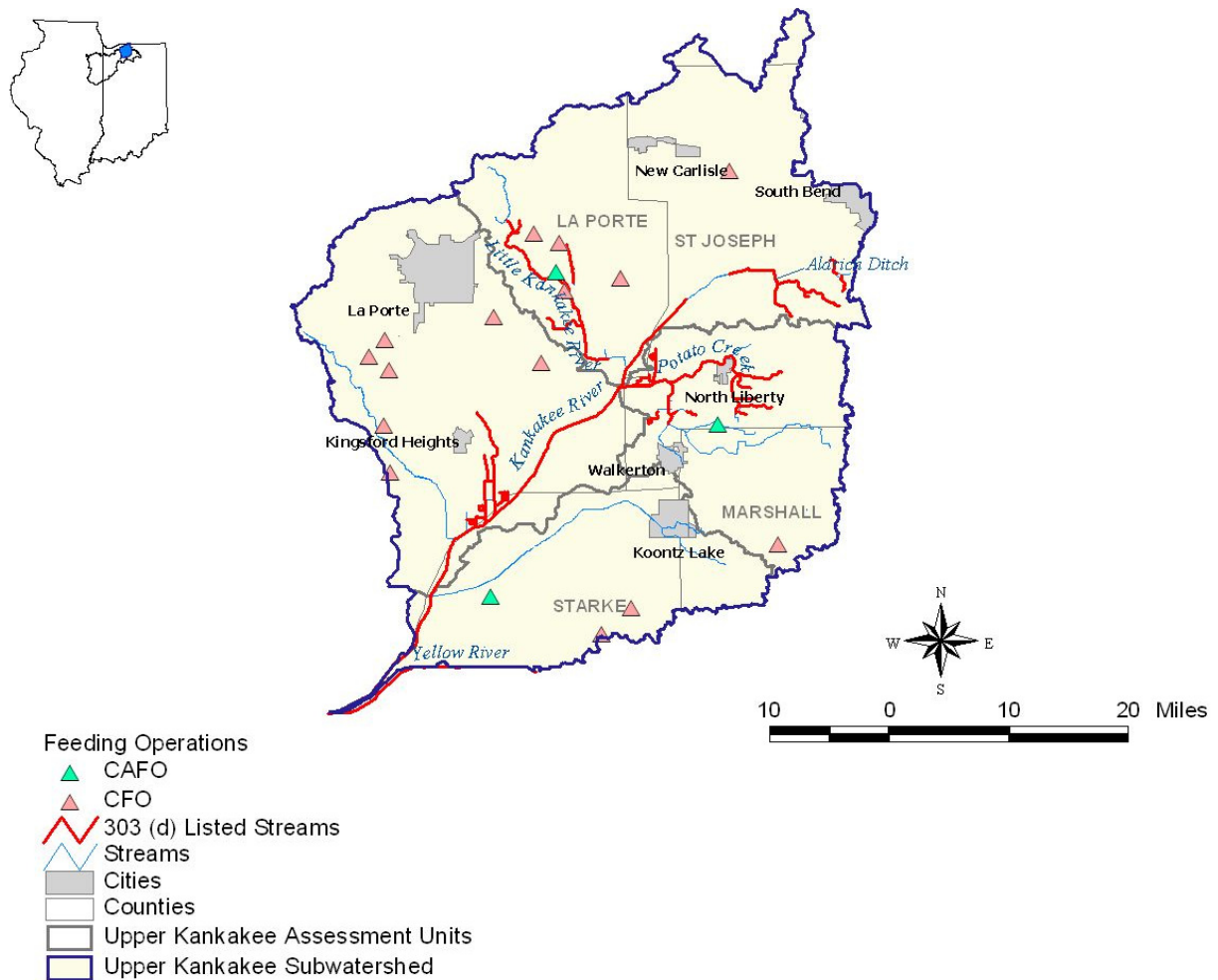


Figure 10. Feeding Operations in the Upper Kankakee Subwatershed

4.1.2 Nonpoint Sources

This section of the report presents information on the nonpoint sources of bacteria in the Upper Kankakee subwatershed.

4.1.2.1 Onsite Wastewater Treatment Systems

Onsite wastewater treatment systems (e.g., septic systems) that are properly designed and maintained should not serve as a source of contamination to surface waters. However, onsite systems do fail for a variety of reasons. Common soil-type limitations which contribute to failure are: seasonal water tables, compact glacial till, bedrock, coarse sand and gravel outwash and fragipan. When these septic systems fail hydraulically (surface breakouts) or hydrogeologically (inadequate soil filtration) there can be adverse effects to surface waters (Horsely and Witten, 1996). Septic systems contain all the water discharged from homes and business and can be significant sources of pathogens.

Failing septic systems have been a problem in portions of the Kankakee/Iroquois River watershed, and illegal methods of dumping waste through straight pipe discharges and septic systems connected to tile drains have been observed in the watershed (IDEM, 2001). Furthermore, septic system malfunctions pose danger to human health when they contaminate drinking water supplies, wells, and fishing and swimming areas.

A comprehensive database of septic systems within the watershed is not available. Therefore, the rural population of each subwatershed was calculated to obtain a general representation of the number of systems. It is assumed that the numbers of septic systems in the subwatersheds are directly proportional to rural population density. The rural population in the Upper Kankakee subwatershed is shown in Table 12, along with a calculated density (total rural population divided by total area). The rural population density can be used to compare the different major subwatersheds within the Kankakee/Iroquois watershed.

It should also be noted that hydrologic soil group A (50%) and B soils (41%) are dominant in the Upper Kankakee subwatershed. Since these soils have good infiltration rates, there is less risk for failing septic systems due to this factor.

Table 12. Rural Population Density in the Upper Kankakee Subwatershed

County	Area of County in Subwatershed (mi ²)	County Population	Urban Population	Rural Population	Rural Population Density (persons/mi ²)
La Porte	294	54,332	23,303	31,029	214
Starke	106	9,278	2,268	7,010	
St. Joseph	194	112,736	14,234	98,502	
Marshall	69	5,597	106	5,491	
Total	663	181,943	39,911	142,032	

4.1.2.2 Confined Animal Feeding Operations (CFOs) and Animal Feeding Operations (AFOs)

Animal feeding operations that are not classified as CAFOs are known as confined feeding operations (CFOs) in Indiana and as animal feeding operations (AFOs) in Illinois. Non-CAFO animal feeding operations are considered nonpoint sources by US. EPA. CAFOs have federal permits and fall under the jurisdiction of the NPDES Program. Indiana's CFOs have state issued permits but are not under the jurisdiction of the federal NPDES Program and are therefore categorized as nonpoint sources for the purposes of this TMDL. Indiana's CFOs are not allowed to discharge under the state permits.

AFOs in Illinois do not have state permits. However, they are subject to state livestock waste regulations and may be inspected by the Illinois EPA, either in response to complaints or as part of the Agency's field inspection responsibilities to determine compliance by facilities subject to water pollution and livestock waste regulations. In Illinois *Animal feeding operation* ("AFO") is defined as a lot or facility (other than an aquatic animal production facility) where the following conditions are met:

- (1) Animals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and
- (2) Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

Like CAFOs, the animals raised in CFOs and AFOs produce manure that is stored in pits, lagoons, tanks and other storage devices. The manure is then applied to area fields as fertilizer. When stored and applied properly, this beneficial re-use of manure provides a natural source for crop nutrition. It also lessens the need for fuel and other natural resources that are used in the production of fertilizer. CFOs and AFOs, however, can pose environmental concerns, including the following:

- Manure can leak or spill from storage pits, lagoons, tanks, etc.
- Improper application of manure can contaminate surface or ground water.
- Manure overapplication can adversely impact soil productivity.

There are 16 CFOs in the Upper Kankakee subwatershed as shown in Table 13 and Figure 10.

Table 13. CFOs in the Upper Kankakee Subwatershed

HUC 10	HUC 10 Name	Farm ID	Operation Name
0712000101	Pine Creek	6203	Leffert Dairy, LLC
0712000102	Little Kankakee River-Kankakee River	6135	Ginter
		3600	Farm No 2
		6072	Sunset Dairy
		4208	Farm #1
		4209	Farm #2
		280	Tuholski Farms, Inc.
0712000104	Mill Creek-Kankakee River	4255	Minich
		1110	C.L. Rhoads Corp
		4169	Applegarth
		3983	Schoof
		6096	Wil-Minfarm
		2187	Yon Ed Farm, Inc.
		250	Meadowland Farms
0712000107	Robbins Ditch-Kankakee River	430	Yankauskas Pork Production
		4676	Tip Top Farms

4.1.2.3 Livestock Population

Livestock are potential source of bacteria to streams, particularly when direct access is not restricted and/or where feeding structures are located adjacent to riparian areas. Watershed specific data are not available for livestock populations. However, county wide data available from the National Agricultural Statistical Service were downloaded and area weighted to estimate animal population in the watershed. There are an estimated 96,620 animal units in the Upper Kankakee subwatershed and the animal unit density is 146 animal units per square mile (Table 14).

Table 14. Animal Unit* Density in the Upper Kankakee Subwatershed

Subwatershed Area (sq. miles)	Animal	Number of Head	Number of Animals in One Animal Unit	Number of Animal Units	Animal Unit Density (animal units/mi ²)
663	Hogs and Pigs	22,447	2.5	8,979	146
	Cattle and Calves	13,955	1	13,955	
	Sheep and Lambs	421	10	42	
	Horses and Ponies	36,822	0.5	73,645	
			Total	96,620	

* An Animal Unit (AU) represents 1,000 pounds of live animal weight. It serves as a common unit for aggregating animals across farms and across animal types

4.1.2.4 Wildlife

Wildlife such as deer, geese, ducks, etc. can be sources of bacteria when they have direct access to streams. Since deer population was available for both Indiana and Illinois, it was used to give a general representation of the wildlife population in the watershed. (Population estimates for other types of wildlife are generally not available). Countywide deer data were area weighted to determine the deer population in each subwatershed (Table 15).

Table 15. Deer Density in the Upper Kankakee Subwatershed.

Subwatershed Area (sq. miles)	County	Deer Population	Deer Density (per/sq. mile)
663	La Porte	917	3
	Starke	547	
	St. Joseph	283	
	Marshall	306	
	Total	2,053	

4.2 Middle Kankakee Subwatershed

The Middle Kankakee subwatershed lies primarily within Indiana but its most downstream section is in Illinois. The subwatershed drains almost 1,000 square miles and covers portions of LaPorte, Starke, Jasper, Lake, Newton, Will, and Kankakee Counties (Figure 11). Cities within the Middle Kankakee subwatershed include Wanatah, Wheatfield, De Motte, Roselawn, Lowell, Lake Dalecarlia, St. John, and Lakes of the Four Seasons.

Land use in the Middle Kankakee subwatershed (Table 16) is dominated by agricultural land (71%) followed by forest (11%). Developed land and grasslands account for 8 percent and 4 percent, respectively. The remaining land categories contribute less than 6 percent of the watershed area.

Table 16. Land Use/Land Cover in the Middle Kankakee Subwatershed

Land Use/Land Cover	Watershed		
	Area		Percent
	Acres	Square Miles	
Agricultural Land	452,684	707	71.98
Forested Land	68,455	107	10.89
Developed Land	51,325	80	8.16
Grassland and Shrubs	24,333	38	3.87
Pasture/Hay	18,614	29	2.96
Wetland	9,026	14	1.44
Open Water	4,426	7	0.7
Total	628,863	983	100



4.2.1 Point Sources

This section summarizes the potential point sources of bacteria in the Middle Kankakee subwatershed.

4.2.1.1 Wastewater Treatment Plants (WWTPs) and Industrial Permits

There are 28 active facilities that are permitted to discharge wastewater containing bacteria within the Middle Kankakee subwatershed (Table 17 and Figure 12). The largest of these is the Lowell WWTP, with an average design flow of four MGD

Table 17. NPDES Facilities in the Middle Kankakee Subwatershed

HUC 10	HUC 10 Name	Permit Number	Facility Name	Receiving Stream	Average Design Flow (MGD)
712000108	Pitner Ditch-Kankakee River	IN0040193	La Crosse Municipal WWTP	Kankakee R Via Marsh Creek Via Trib	0.0670
		IN0053104	Little Co Of Mary Health Facility	Kankakee R Via Drainage Ditch	0.0400
712000109	Hodge Ditch	IN0058823	Martis Place Bomars River Lg	Um/Kankakee Riv/Marble Powers Ditch	0.0075
		IN0060852	Town Of Monterey WWTP	Um/Kankakee Riv/Marble Powers Ditch	0.0310
		IN0040754	Wheatfield Municipal WWTP	Kankakee R Via Hodge D Via Wolf Cr	0.0770
712000110	Crooked Creek-Kankakee River	IN0045888	Boone Grove Elem & Middle School	Um/Kankakee River/Phillips Ditch	0.0230
		IN0057029	Boone Grove High School WWTP	Kankakee R Via Luddington D - Arm 3	0.0180
		IN0020061	Hebron Municipal WWTP	Cobb Creek/Breyfogel Dt/Kankakee R	0.5200
		IN0061450	Hebron WWTP	Kankakee R / Cobb Cr / Storm Sewer	0.0250
		IN0023400	Kouts Municipal WWTP	Kankakee R Via Benkie Ditch	0.3300
		IN0051446	Lake Eliza Conservancy Dist	Kankakee R Via Wolf Cr - Ludington	0.0870
		IN0052248	Morgan Township School	Kankakee R Via Sandy Hook D-Ahlgrim	0.0132
		IN0056669	Wanatah Wastewater Treatment Plant	Kankakee R Via Slocum Ditch	0.0780
		IN0057703	Washington Twp School WWTP	Kankakee R Via Hutton Ditch	0.0400
		IN0042978	Westville Correctional Center	Crooked Cr To Kankakee River	0.7500
		IN0024848	Westville WWTP	Crooked Cr Via Crumpacker Arm	0.3500
712000111	Knight Ditch-Kankakee River	IN0039926	Demotte Municipal WWTP	Kankakee R Via Evers Ditch	0.4960
		IN0031275	Kankakee Rest Area	Kankakee R Via Otis-Boyle Ditch	0.0495
		IN0030503	Lincoln Elementary School	Um/Kankakee River/Hibler Ditch	0.0342
		IN0030651	South Haven Sewer Works WWTP	Lt Calumet R Via Salt Creek	2.0000
		IN0039101	Water Services Co Of Indiana	Um/Kankakee R/Candlewood Lateral Dt	0.1550
712000112	Beaver Lake Ditch-Kankakee River	IN0031143	North Newton Jr Sr High School	Um/Kankakee R/Beaver Cr/Open Ditch	0.0300
		IN0058548	Buckhill Estates WWTP	Um/Kankakee R/Cedar Creek/Foss Ditch	0.0192

Table 17. NPDES Facilities in the Middle Kankakee Subwatershed

HUC 10	HUC 10 Name	Permit Number	Facility Name	Receiving Stream	Average Design Flow (MGD)
712000112	Beaver Lake Ditch-Kankakee River	IN0033081	Dalecarlia Utilities Lake Dale	Cedar Cr To Kankakee River	0.0440
		IN0023621	Lowell WWTP	Cedar Cr To Kankakee River	4.0000
		IN0040592	Schneider WWTP	Kankakee R Via Brown Ditch	0.0650
		IN0037176	Twin Lakes Utilities	Kankakee R/E Br Stoney Run Crk	1.1000
		IN0031127	Winfield Elementary School	Kankakee R Via Stony Run Cr E Fk	0.0100
			Total		10.4596

4.2.1.2 Combined Sewer Overflows (CSOs)

There is only one CSO in the Middle Kankakee subwatershed—an equalization basin overflow in the city of Lowell (Table 18 and Figure 12).

Table 18. CSOs in the Middle Kankakee Subwatershed

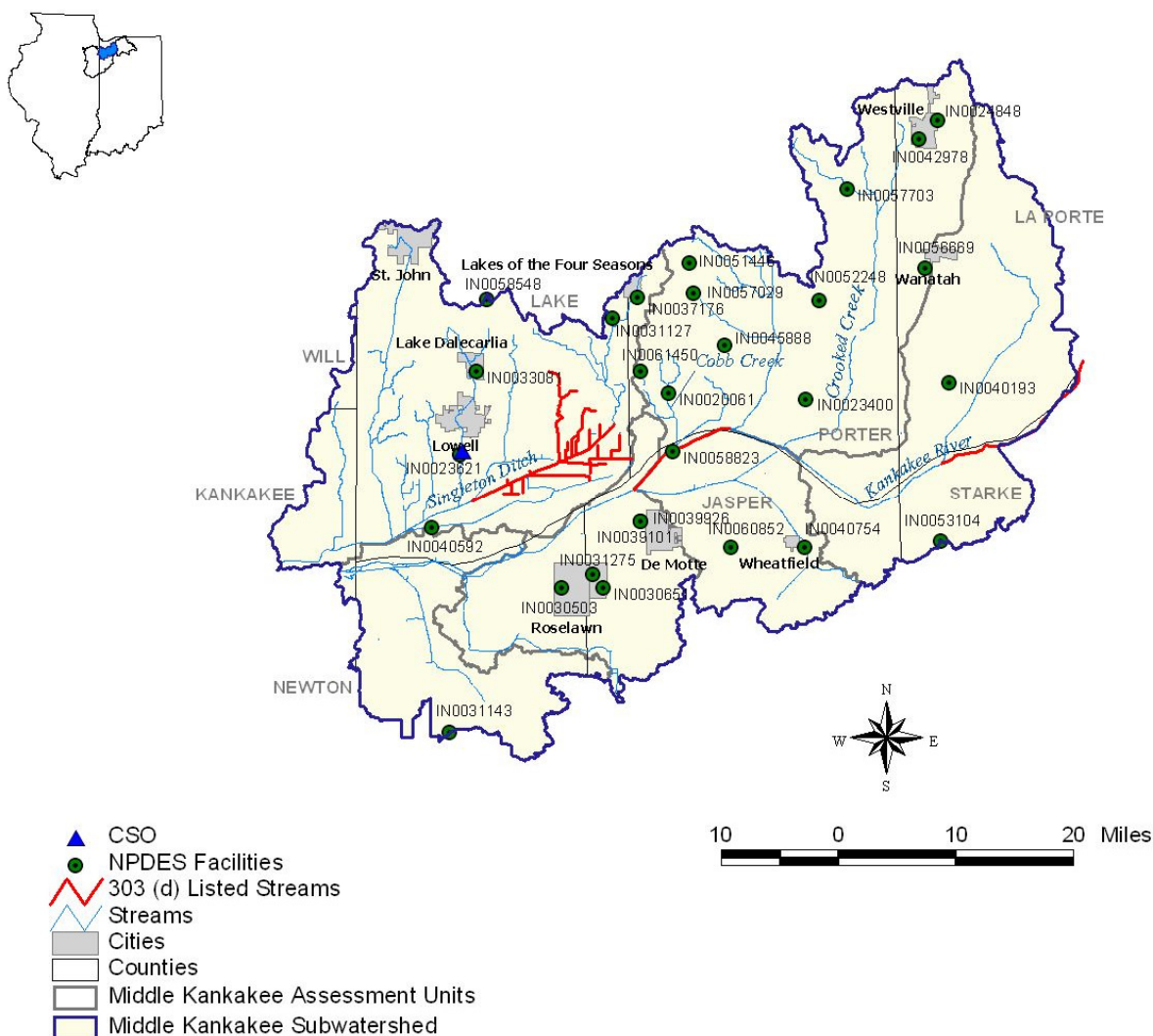
HUC 10	HUC 10 Name	Permit #	Facility	Outfall #	Pipe Description	Receiving Stream
712000113	Singleton Ditch	IN0023621	Lowell Municipal STP	004C	CSO-Equalization Basin Overflow	Cedar Creek

4.2.1.3 Municipal Separate Storm Sewer System (MS4)

There are eight MS4 communities in the Middle Kankakee subwatershed (Table 19) that total approximately 32 square miles.

Table 19. MS4 Communities in the Middle Kankakee Subwatershed

MS4 Facility Permit ID	MS4 Name	Area (Square Miles)
INR040007	Lakes of the Four Seasons POA	1.1
INR040046	Town of Lowell	4.2
INR040047	Town of St. John	4.3
INR040054	City of Crown Point	0.3
INR040075	Town of Cedar Lake	7.7
INR040124	Lake County	9.4
INR040140	Porter County	3.0
INR04073 Co-Permit	Valparaiso	1.9

**Figure 12. NPDES Facilities in the Middle Kankakee Subwatershed**

4.2.1.4 **Concentrated Animal Feeding Operations (CAFOs)**

There are eight CAFOs in the Middle Kankakee subwatershed (Table 20 and Figure 13). Six of the CAFOs are located south and southeast of Roselawn.

Table 20. CAFOS in the Middle Kankakee Subwatershed

HUC 10	HU C 10 Name	NPDES ID	Operation Name
712000108	Pitner Ditch-Kankakee River	ING806292	David And Brenda Wolfe
		ING801092	Smoker Farms
712000111	Knight Ditch-Kankakee River	ING804410	Dekock Feedlot, Inc.
		ING801782	Dekock Feedlot Inc.
		ING802170	Bos Farms-Dry Cow Facility
		ING806155	Bos Dairy Site # 4
712000112	Beaver Lake Ditch-Kankakee River	ING806015	Fair Oaks Dairy Farm North
		ING806154	Herrema Dairy

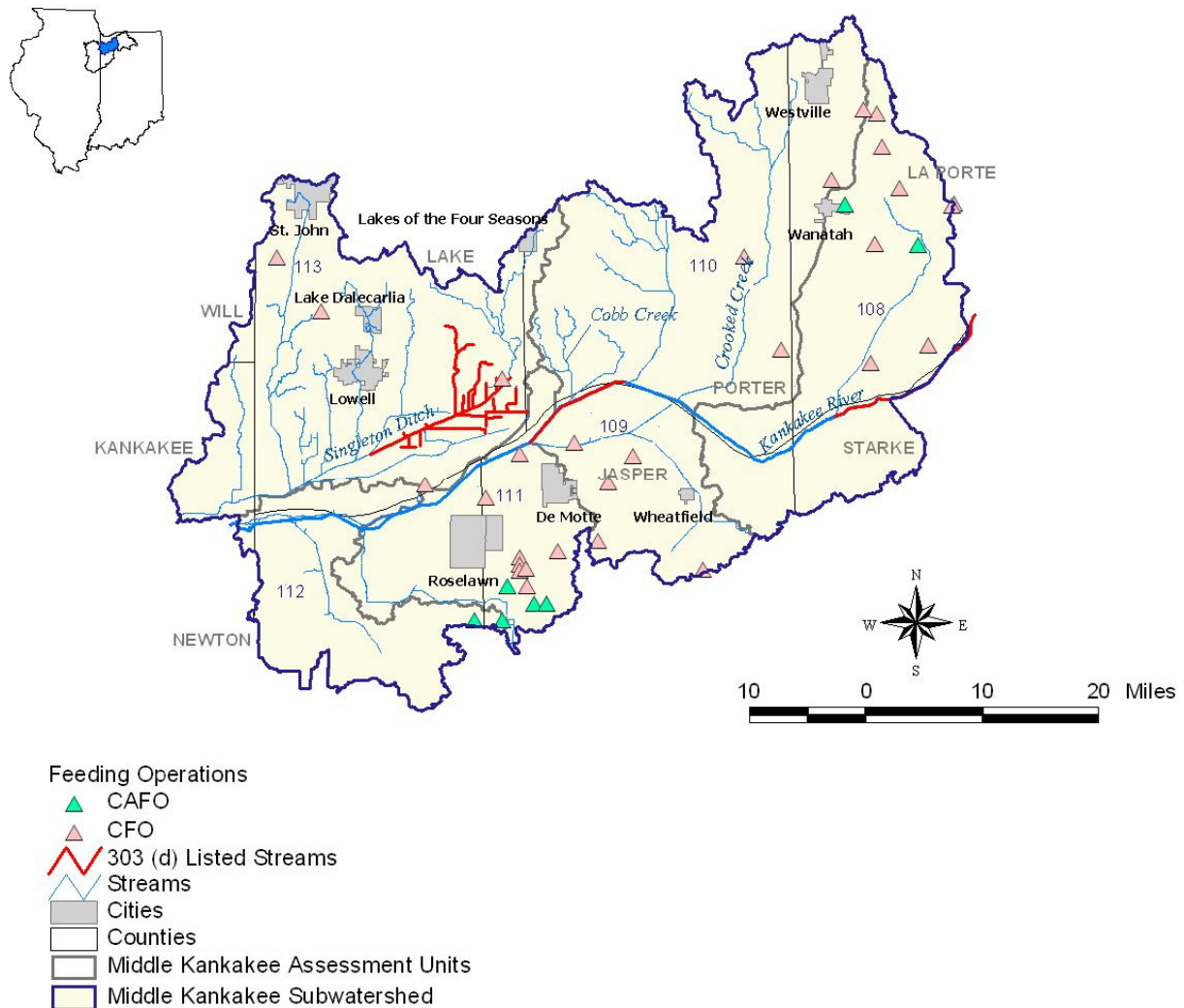


Figure 13. Feeding Operations in the Middle Kankakee Subwatershed

4.2.2 Nonpoint Sources

The following section identifies the potential nonpoint sources in the Middle Kankakee subwatershed.

4.2.2.1 Onsite Wastewater Treatment Systems

The rural population in the Middle Kankakee subwatershed is shown in Table 21, along with a calculated density (total rural population divided by total area). The rural population density of the Middle Kankakee is significantly higher than that of the Upper Kankakee (214 persons per square mile).

Hydrologic soil group A (45%) and B soils (28%) are dominant in the Middle Kankakee subwatershed. Soil group C comprises 23 percent of the land area, primarily in the Singleton and Cobb Creek drainages (Figure 5). Due to the slow infiltration rate of C soils, there is an increased likelihood of failing septic systems in this part of the watershed. Other soil categories (A/D, B/D and C/D and D) constitute less than 4 percent of the subwatershed area.

Table 21. Rural Population Density in the Middle Kankakee Subwatershed

County	Area of County in Subwatershed (mi ²)	Estimated County Population in Subwatershed	Urban Population	Rural Population	Rural Population Density (persons/mi ²)
Will	3.89	3,104	0	3,104	315
Kankakee	31.18	5,026	0	5,026	
La Porte	171.64	31,697	3,689	28,008	
Porter	219.50	84,053	10,079	73,974	
Lake	224.02	222,765	29,240	193,525	
Starke	36.45	3,199	156	3,043	
Jasper	165.32	9,998	7,939	2,059	
Newton	130.94	5,824	4,788	1,036	
Total	982.94	365,666	55,891	309,775	

4.2.2.2 Confined Animal Feeding Operations (CFOs) and Animal Feeding Operations (AFOs)

There are 31 CFOs in the Middle Kankakee subwatershed (Table 22 and Figure 13).

They are primarily located in the southern part of the subwatershed near Roselawn and in the northeastern portion of the watershed near Wanatah. The number of AFOs in the Illinois portion of the Middle Kankakee watershed is currently unavailable.

Table 22. CFOs in the Middle Kankakee Subwatershed

HUC 10	Watershed Name	Farm ID	Operation Name
0712000108	Pitner Ditch-Kankakee River	3548	Farm #1
		3992	Dgm Pork
		6114	Hoover Farms
		2547	Farm #2
		6109	Hardin Farms
		3126	Stull Farm
		3925	Rich-Lou Farms
		85	Brian Hunsley
		3896	Phegley
		3045	Hundt
0712000109	Hodge Ditch	4250	Farm & Feeders, Inc.
		4804	Klemp
		1028	Abbring
		1962	Bales
		3498	Mulder
0712000110	Crooked Creek-Kankakee River	4898	Kresel
		3515	Taber Veal
		2325	Good
		1053	Bucher Hog Farm
0712000111	Knight Ditch-Kankakee River	1063	Hamstrafarms
		4344	Hamstra Brothers
		92	Devries Farms Inc
		3993	Walstra
		4432	H & H Feedlots
		4692	Northern Trust Farm #180
		3716	Vander Molen
		2003	Mathis
0712000113	Singleton Ditch	2466	Jonkman
		661	Kleine
		1467	Bryantfarm
		810	Huseman Farm Inc.

4.2.2.3 Livestock Population

The animal unit density (Table 23) in the Middle Kankakee subwatershed is estimated at 65 animal units per square mile which is considerably less than that of the Upper Kankakee subwatershed.

Table 23. Livestock Density in the Middle Kankakee Subwatershed

Subwatershed Area (sq. miles)	Animal	Number of Head	Number of Animals in One Animal Unit	Number of Animal Units	Animal Unit Density (per square mile)
983	Hogs and Pigs	54,367	2.5	21,747	65
	Cattle and Calves	29,070	1	29,070	
	Poultry	681	50	14	
	Sheep and Lambs	2,424	10	242	
	Horses and Ponies	6,448	0.5	12,896	
			Total	63,969	

4.2.2.4 Wildlife

The deer population in the Middle Kankakee subwatershed is 4,295 and the density is 4 deer per square mile (Table 24).

Table 24. Deer Density in the Middle Kankakee Subwatershed

Subwatershed Area (sq. miles)	County	Deer Population	Deer Density (per sq. mile)
983	Pulaski	16	4
	Will	127	
	Kankakee	824	
	La Porte	1,864	
	Porter	637	
	Lake	72	
	Starke	421	
	Jasper	0	
	Newton	333	
	Total	4,295	

4.3 Yellow River

The Yellow River subwatershed lies solely in Indiana, covering nearly 540 square miles of the headwater reaches of the Kankakee. It drains portions of St. Joseph, Kosciusko, Marshall, Starke, and Pulaski and Elkhart Counties. Cities within the Yellow River subwatershed include Bremen, Plymouth, Argos, Knox, and North Judson (Figure 14).

As in the Upper and Middle Kankakee subwatersheds, the land in the Yellow River subwatershed is primarily used for agriculture (68%). Forested, developed and pasture land comprise 14 percent, 8 percent and 4 percent of the total subwatershed area, respectively. Grasslands occupy nearly 2 percent of the total area. Wetlands and open water comprise four percent of the total subwatershed area (Table 25).

Table 25. Land Use/Land Cover in the Yellow River Subwatershed

Land Use/Land Cover	Watershed		
	Area		Percent
	Acres	Square Miles	
Agricultural Land	233,992	366	67.94
Forested Land	47,742	75	13.86
Developed Land	30,392	47	8.82
Pasture/Hay	14,179	22	4.12
Wetland	9,519	15	2.76
Grassland and Shrubs	5,279	8	1.53
Open Water	3,324	5	0.97
Total	344,426	538	100.00

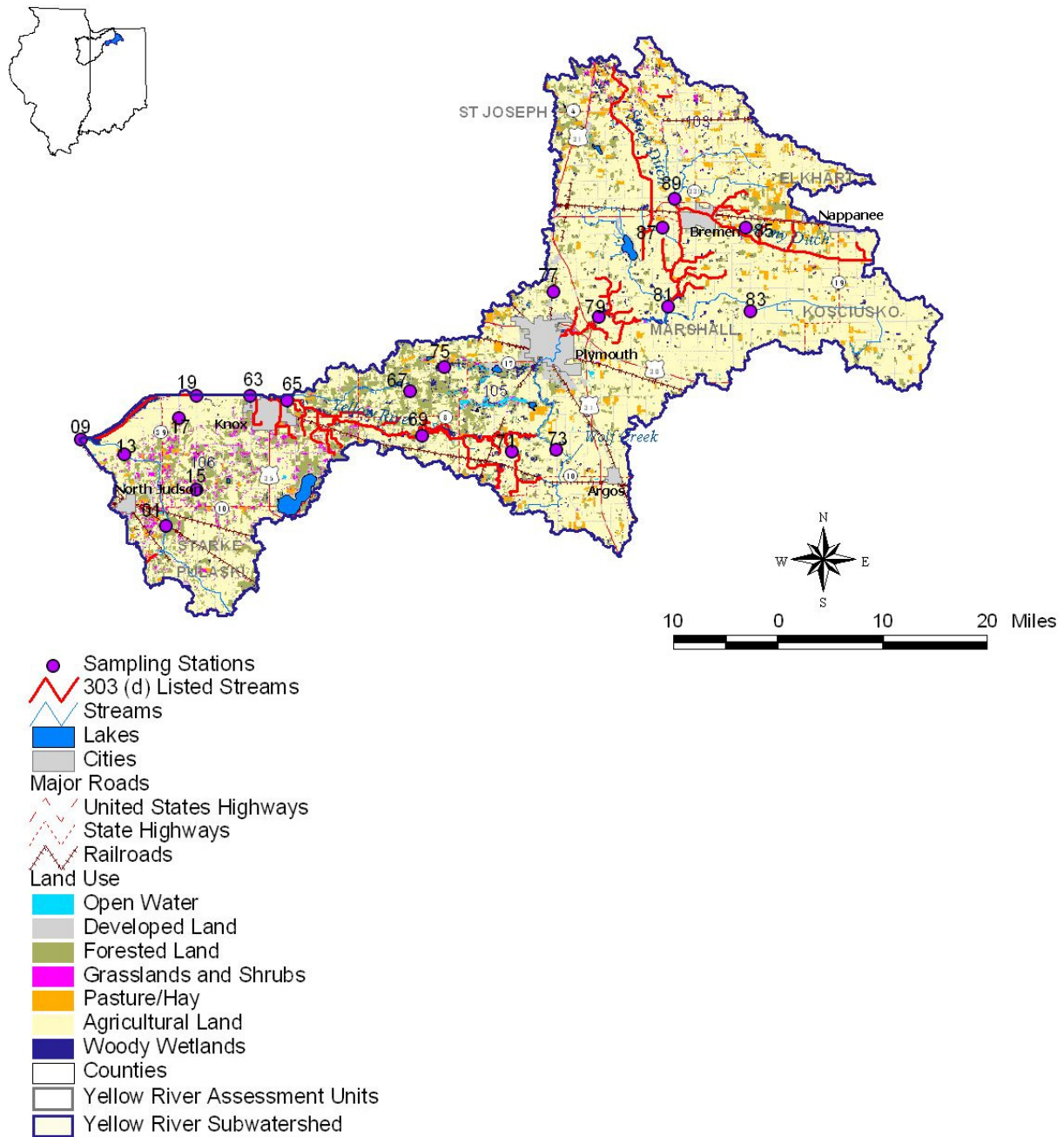


Figure 14. Land use in the Yellow River Subwatershed

4.3.1 Permitted Point Sources

This section summarizes the potential point sources of bacteria in the Yellow River subwatershed.

4.3.1.1 Wastewater Treatment Plants (WWTPs) and Industrial Facilities

Ten facilities are permitted to discharge bacteria in the Yellow River subwatershed as listed in Table 26 and Figure 15. While the Nappanee Municipal STP lies within the Yellow River Subwatershed, it discharges outside of the watershed. Plymouth is the largest WWTP with an average design flow of 3.5 MGD.

Table 26. NPDES Facilities in the Yellow River Subwatershed

HUC 10	HUC 10 Name	Permit Number	Facility Name	Receiving Stream	Average Design Flow (MGD)
712000103	Headwaters Yellow River	IN0020427	Bremen Municipal WWTP	Um/Kankakee R/Yellow River	1.300
		IN0057002	Lake Of The Woods RSD	Yellow R Via Stock Ditch	0.135
		IN0040223	Lapaz Municipal WWTP	Yellow R Via Elmer Seltentright Dit.	0.126
		IN0021466	Nappanee Municipal STP	Elkhart River	1.900
712000105	Yellow River	IN0022284	Argos Municipal WWTP	Yellow R/Myers Ditch/Unnmd Ditch	0.212
		IN0025160	Convent Ancilla Dominion	Gilbert Lake To Flat Lake	0.046
		IN0021385	Knox Municipal WWTP	Um/Kankakee River/Yellow River	0.700
		IN0020991	Plymouth WWTP	Yellow R To Kankakee River	3.500
712000106	Kline Arm	IN0058289	Bass Lake Conservancy District	Craigmile Ditch	0.284
		IN0020877	North Judson Municipal WWTP	Kankakee R Via Pine Creek & Unnamed T	0.470
			Total		8.673

4.3.1.2 Combined Sewer Overflows (CSOs)

Combined sewer overflows in Plymouth, Nappanee, and North Judson are potential sources of bacteria in the Yellow River subwatershed (Table 27 and Figure 15).

Table 27. CSOs in the Yellow River Subwatershed

HUC 10	HUC 10 Name	Permit #	Facility	Outfall #	Pipe Description	Receiving Stream
712000105	Yellow River	IN0020991	Plymouth Municipal STP	002C	CSO-S.W. Retent. Basin Overflow	Yellow River
				009C	CSO-Sixth St. 12-Inch	Yellow River
				010C	CSO-15-In Overflow Near POTW	Yellow River
				011C	CSO-Simon St.	Yellow River
				008C	CSO-Adams/Water St	Yellow River
				007C	CSO-Cleveland St. Regulator	Yellow River
				006C	CSO-Bailey St. Regulator	Yellow River
				005C	CSO-Bird Park	Yellow River
				004C	CSO-Elliot/Fairbanks Ave	Yellow River
				003C	CSO-Klinger Ave/Fairbanks Ave	Yellow River
712000103	Headwaters Yellow River	IN0021466	Nappanee Municipal STP	013C	CSO- Alley Btw Locke/Clark	Berlin Court Ditch
				012C	CSO- Clark St.	Berlin Court Ditch
				011C	CSO- Main St.	Berlin Court Ditch
				010C	CSO- Elm St.	Berlin Court Ditch
				009C	CSO- Madison St.	Berlin Court Ditch
				008C	CSO- Hartman St.	Berlin Court Ditch
				007C	CSO- Summit St.	Berlin Court Ditch
				006C	CSO-Jackson St.	Berlin Court Ditch
				005C	CSO- Woodland Dr.	Berlin Court Ditch
				004C	CSO- Morningside Drive	Berlin Court Ditch
				003C	CSO- Marion St.	Berlin Court Ditch
				002C	CSO- Mariam St	Berlin Court Ditch
				016C	CSO-Eq Basin At WWTP	Berlin Court Ditch
712000106	Kline Arm	IN0020877	North Judson Municipal	004C	CSO-ELM St. Lift Station	Unnamed Ditch

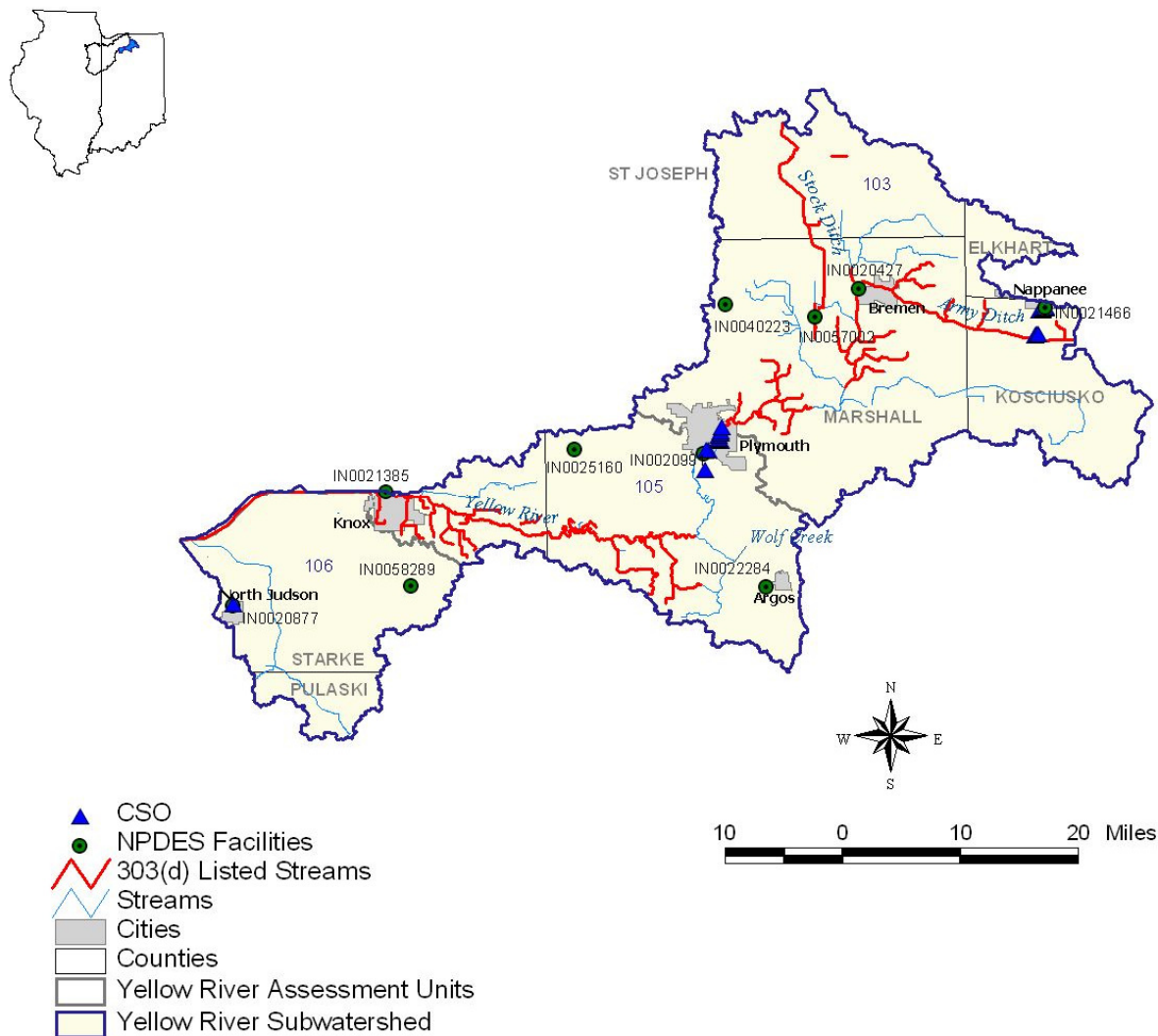


Figure 15. NPDES Facilities in the Yellow River Subwatershed

4.3.1.3 Municipal Separate Storm Sewer System (MS4)

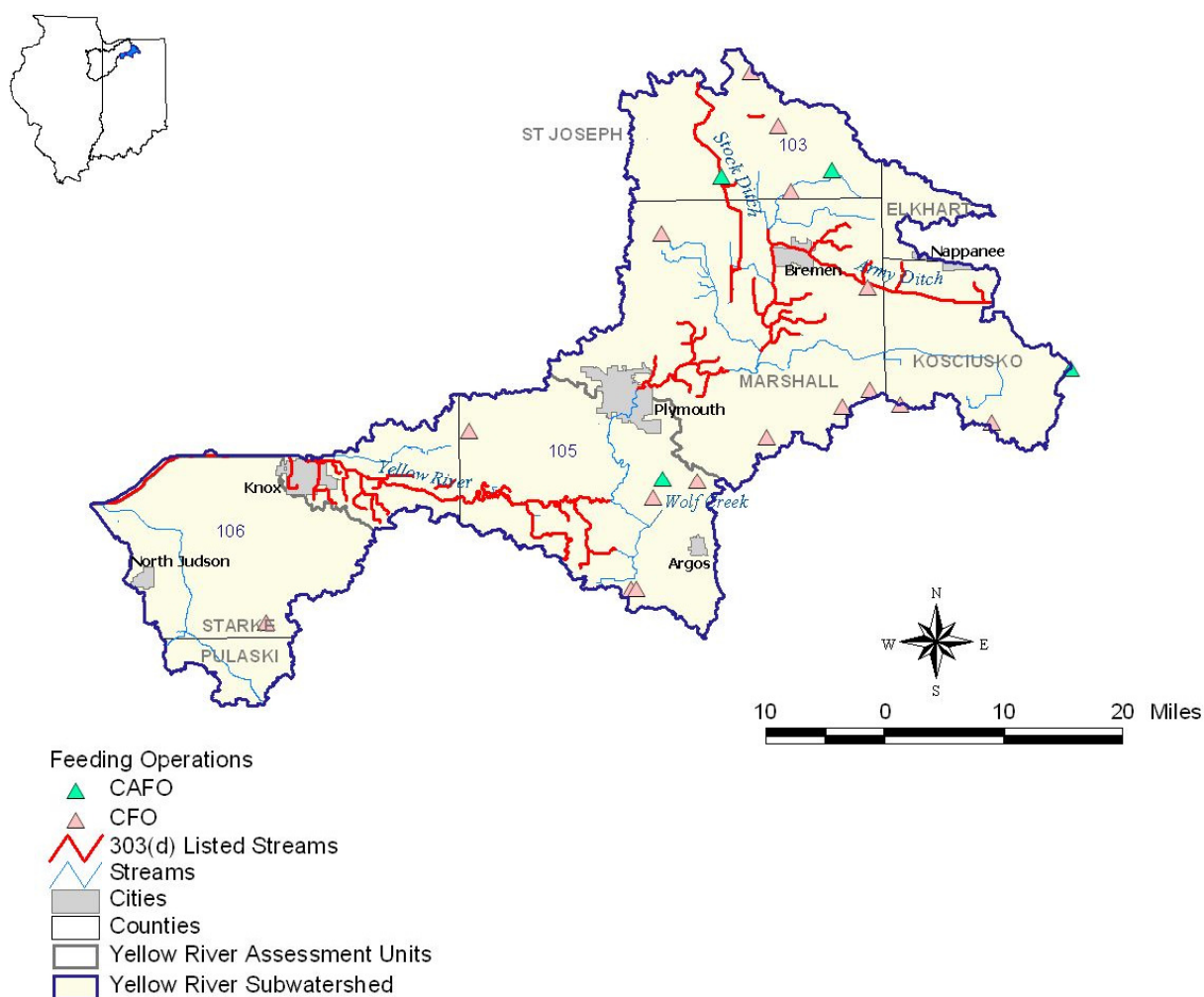
Plymouth is the only MS4 in the Yellow River subwatershed, covering an area of seven square miles.

4.3.1.4 Concentrated Animal Feeding Operations (CAFOs)

There are 4 CAFOs in the Yellow River watershed (Table 28 and Figure 16).

Table 28. CAFOs in the Yellow River Subwatershed

Major Subwatershed	HUC 10	HUC 10 Name	NPDES ID	Operation Name
Yellow	712000103	Headwaters Yellow River	ING8040910	Fred Beer Farms, Inc.
			INA006440	Walnut Grove Dairy, LLC
			ING800005	J & T Laidig Farms
	712000105	Yellow River	ING804918	Homestead Dairy

**Figure 16. Feeding Operations in the Yellow River Subwatershed**

4.3.2 Nonpoint Sources

The following section identifies the potential nonpoint sources in the Yellow River subwatershed.

4.3.2.1 Onsite Wastewater Treatment Systems

The rural population in the Yellow River subwatershed is shown in Table 29, along with a calculated rural density of 141 persons per square mile, which is less than that of the Upper and Middle Kankakee subwatersheds.

The dominant soils found in this region are A (42%) and B (38%) with C soils comprising 15 percent of the subwatershed.

Table 29. Rural Density in the Yellow River Subwatershed

County	Area of County in Subwatershed (mi ²)	Estimated County Population in Subwatershed	Urban Population	Rural Population	Rural Population Density (persons/mi ²)
Elkhart	11.68	4,991	511	4,480	141
Kosciusko	56.22	8,006	1,383	6,623	
St Joseph	64.90	37,846	567	37,279	
Marshall	270.87	30,561	7,990	22,571	
Starke	120.19	10,546	6,307	4,239	
Pulaski	14.62	468	0	468	
Total	538.49	92,419	16,758	75,661	

4.3.2.2 Confined Animal Feeding Operations (CFOs)

There are 16 CFOs in the Yellow River subwatershed with many of them located along the border of the watershed (Table 30 and Figure 16).

Table 30. CFOs in the Yellow River Watershed

Major Subwatershed	HUC 10	HUC 10 Name	Farm ID	Operation Name
Yellow	0712000103	Headwaters Yellow River	3050	Shively Veal Inc
			3710	Lizzi
			3891	Pick Of The Chick
			2372	Trowbridge Veal
			4349	Dinius
			4330	Farm #1
			4254	Huff
			4388	Haas
			2276	Fisher
			2240	Laidig Farm & Management
	0712000105	Yellow River	6151	Houin, Jr.
			2100	Argos Holsteins
			796	Houin Brothers Farms
			2215	Schaller
			6208	Argos Holsteins
	0712000106	Kline Arm	3908	Bope Farm

4.3.2.3 Livestock Population

There are a large number of hogs, cattle, and poultry in the Yellow River subwatershed and the animal unit density was calculated at 329 units per square mile (Table 31). This value is considerably higher than the densities calculated for the Upper and Middle Kankakee subwatersheds.

Table 31. Animal Unit* Density in the Yellow River Subwatershed

Subwatershed Area (sq. miles)	Animal	Number of Head	Number of Animals in One Animal Unit	Number of Animal Units	Animal Unit Density (per sq. mile)
538	Hogs and Pigs	179,814	2.5	71,926	329
	Cattle and Calves	90,523	1	90,523	
	Poultry	637,530	50	12,751	
	Sheep and Lambs	244	10	24	
	Horses and Ponies	987	0.5	1,974	
			Total	177,198	

* An Animal Unit (AU) represents 1,000 pounds of live animal weight. It serves as a common unit for aggregating animals across farms and across animal types

4.3.2.4 Wildlife Population

The deer population in this subwatershed is estimated at approximately 2,900 (Table 32), which is only slightly higher than that calculated for the Upper and Middle subwatersheds.

Table 32. Deer Density in the Yellow River Subwatershed

Subwatershed Area (sq/ miles)	County	Deer Population	Deer Density (per/sq. miles)
538	Elkhart	158	5
	Kosciusko	167	
	St Joseph	1,574	
	Marshall	328	
	Starke	622	
	Pulaski	47	
	Total	2,897	

4.4 Upper Iroquois

The Upper Iroquois subwatershed lies primarily within Indiana but its most downstream section is in Illinois. The subwatershed drains almost 685 square miles and covers portions of Starke, Pulaski, White, Jasper, Newton, Benton, and Iroquois Counties (Figure 17). Cities within the Upper Iroquois subwatershed include Rensselaer, Collegeville, Goodland, Brook, Kentland, and Sheldon.

This subwatershed is predominantly used for agriculture (84%). Developed and forested lands each account for 6 percent of the total watershed area. The remaining land use categories comprise less than 4 percent of the subwatershed area (Table 33).

Table 33. Land Use/Land Cover in the Upper Iroquois Subwatershed

Land Use/Land Cover	Watershed		
	Area		Percent
	Acres	Square Miles	
Agricultural Land	368,676	576.06	84.11
Forested Land	27,192	42.49	6.2
Developed Land	26,680	41.69	6.09
Pasture/Hay	10,636	16.62	2.43
Grassland and Shrubs	2,344	3.66	0.53
Wetland	1,722	2.69	0.39
Open Water	1,082	1.69	0.25
Total	438,332	684.90	100.00

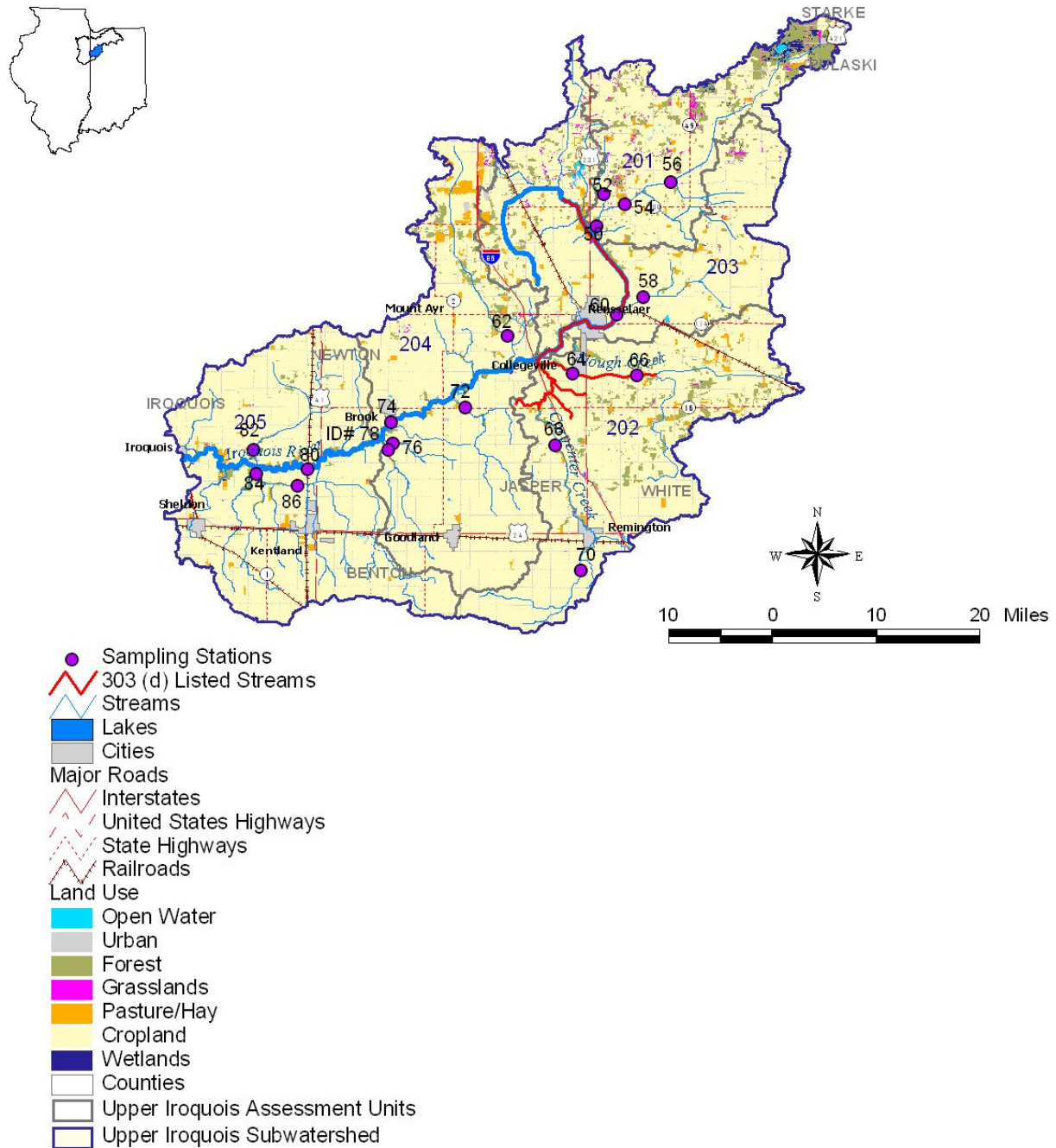


Figure 17. Land use in the Upper Iroquois Subwatershed

4.4.1 Point Sources

This section summarizes the potential point sources of bacteria in the Upper Iroquois subwatershed.

4.4.1.1 Wastewater Treatment Plants (WWTPs) and Industrial Facilities

Eight facilities are permitted to discharge bacteria in the Upper Iroquois River subwatershed as listed in Table 34 and shown in Figure 18. Among these, the Rensselaer Municipal STP is the largest facility with an average design flow of 1.2 MGD.

Table 34. NPDES Facilities in the Upper Iroquois Subwatershed

HUC 10	HUC 10 Name	Permit Number	Facility Name	Receiving Stream	Average Design Flow (MGD)
712000202	Slough Creek	IN0020940	Remington WWTP	Iroquois R Via Carpenter Creek	0.429
712000203	Bruner Ditch-Iroquois River	IN0024414	Rensselaer Municipal STP	Iroquois River	1.200
712000204	Curtis Creek-Iroquois River	IN0050997	George Ade Mem Health Care Car	Iroquois River	0.014
		IN0040070	Goodland Municipal WWTP	Iroquois R Via Hunter Ditch Trib	0.095
		IN0053422	Grandmas Home Cooking	Iroquois R Via Yeoman Ditch Trib	0.029
		IN0041904	Trail Tree Inn	Iroquois R Via Curtis Creek Trib	0.256
712000205	Montgomery Ditch-Iroquois River	IN0039764	Brook Municipal WWTP	Iroquois River	0.100
		IN0023329	Kentland Municipal WWTP	Iroquois R Via Montgomery Via Kent	0.460
			Total		2.622

4.4.1.2 Combined Stormwater Overflows (CSOs)

There are nine CSO outfalls in the Upper Iroquois subwatershed, all located in Rensselaer. Information on these outfalls is presented in Table 35 and they are shown in Figure 18.

Table 35. CSOs in the Upper Iroquois Subwatershed

HUC 10	HUC 10 Name	Permit #	Facility	Outfall #	Pipe Description	Receiving Stream
712000203	Bruner Ditch-Iroquois River	IN0024414	Rensselaer Municipal STP	006C	CSO-545 Park Avenue	Iroquois River
				023C	CSO-Melville St At Iroq. River	Iroquois River
				003C	CSO-Near Milton St.	Iroquois River
				007C	CSO- Grace St.	Iroquois River
				008C	CSO-Corner Of Rutsen/Front St	Iroquois River
				010C	CSO-Near Harrison/Front Sts.	Iroquois River
				021C	CSO-W Corner Starling/Milroy Av	Iroquois River
				014C	CSO-South of Wash. St.-W. Of River	Iroquois River
				019C	CSO-Rec Stat-Ne of Lift Stat	Iroquois River



Figure 18. NPDES Facilities in the Upper Iroquois Subwatershed

4.4.1.3 Municipal Separate Storm Sewer System (MS4)

There are no MS4 communities in the Upper Iroquois subwatershed.

4.4.1.4 Concentrated Animal Feeding Operations (CAFOs)

There are 12 CAFOs in the Upper Iroquois watershed as listed in Table 36 and shown in Figure 19.

Table 36. CAFOs in the Upper Iroquois Subwatershed

HUC 10	HUC 10 Name	NPDES ID	Operation Name
712000201	Oliver Ditch	ING806083	Newberry Farms, LLC
712000202	Slough Creek	ING802689	Tip Top Pigs Inc #1
		ING803422	White County Egg Farm
712000203	Bruner Ditch-Iroquois River	ING800876	Grow Feedlots
		ING806045	Windy Ridge Dairy
712000204	Curtis Creek-Iroquois River	ING806207	Seven Hills Dairy, LLC
		ING803372	Newton County Egg Farm
		N/A	Cambalot Swine Breeders
		ING806036	Fair Oaks Dairy Farm South
		ING803732	Calf Land, LLC
		ING806341	Fair Oaks Dairy Farm, LLC. - North Central # 5
		ING806065	Fair Oaks Dairy Farm West

*N/A not available



Figure 19. Feeding Operations in the Upper Iroquois Subwatershed

4.4.2 Nonpoint Sources

The following section identifies the potential nonpoint sources in the Upper Iroquois subwatershed.

4.4.2.1 Onsite Wastewater Treatment Systems

The rural population in the Upper Iroquois subwatershed is shown in Table 37, along with a calculated rural density of 29 persons per square mile, which is significantly less than that of the Upper, Middle, and Yellow River subwatersheds.

This subwatershed is dominated by B soils (40%) and A soils (28%). Soils C, D, and B/D represent 24 percent, 4 percent, and 2 percent of the total land area, respectively.

Table 37. Rural Density in the Upper Iroquois Subwatershed

County	Area of County in Subwatershed (mi ²)	Estimated County Population in Subwatershed	Urban Population	Rural Population	Rural Population Density (persons/mi ²)
Iroquois	29.06	1,766	1,439	327	29
Starke	0.49	46	0	46	
Jasper	368.84	22,298	6,800	15,498	
Pulaski	6.02	192	0	192	
Newton	198.09	5,628	4,127	1,501	
White	22.42	1,082	0	1,082	
Benton	60.49	1,347	0	1,347	
Total	685.41	32,360	12,366	19,994	

4.4.2.2 Confined Animal Operations (CFOs) and Animal Operations (AFOs)

There are 23 CFOs in the Upper Iroquois watershed as shown in Table 38 and Figure 19.

Table 38. CFOs in the Upper Iroquois Watershed

Major Subwatershed	HUC 10	HUC 10 Name	Farm ID	Operation Name
Upper Iroquois	0712000201	Oliver Ditch	6355	Whitaker
	0712000202	Slough Creek	3506	Jasper County Pullets
			4390	Hathaway
			516	Jack Rodibaugh & Sons Inc
			745	Frey
			3423	White County Pullets
			4260	Streitmatter
			2891	Streitmatter
	0712000203	Bruner Ditch-Iroquois River	3700	Iroquois Valley Swine Breeders
			4056	Hurley Swine Enterprises #1
			652	Davisfarm
			4337	Moore Farms
			230	Bruce Wuethrich Farm
			4991	Northwind Pork LLC
			2284	Bailey
			4656	G.O.P. Farms
			4235	Parkinson & Rodibaugh
	0712000204	Curtis Creek-Iroquois River	2399	Nursery/Finishing Site
			1043	Lyons Enterprises
			651	Korniak & Miller
			3279	Oinker Acres
	0712000205	Montgomery Ditch-Iroquois River	1680	Carl E Funk Farms
			669	Clark

4.4.2.3 Livestock Population

There are a large number of hogs in the Upper Iroquois subwatershed and the animal unit density was calculated at 185 units per square mile (Table 39). This value is higher than the densities calculated for the Upper and Middle Kankakee subwatersheds but less than that of the Yellow River.

Table 39. Livestock Density in the Upper Iroquois Subwatershed

Subwatershed Area (sq. miles)	Animal	Number of Head	Number of Animals in One Animal Unit	Number of Animal Units	Animal Unit Density (per/sq. mile)
685.41	Hogs and Pigs	237,790	2.5	95,116	185
	Cattle and Calves	29,109	1	29,109	
	Poultry	33	50	1	
	Sheep and Lambs	1,546	10	155	
	Horses and Ponies	1,256	0.5	2,513	
			Total	126,893	

4.4.2.4 Wildlife Population

The Upper Iroquois subwatershed has an estimated deer density of two deer per square mile (Table 40).

Table 40. Deer Density in the Upper Iroquois Subwatershed

Subwatershed Area (sq. miles)	County	Deer Population	Deer Density
685	Iroquois	28	2
	Starke	3	
	Jasper	993	
	Pulaski	20	
	Newton	504	
	White	43	
	Benton	2	
	Total	1,592	

4.5 Lower Iroquois

The Lower Iroquois subwatershed lies primarily within Illinois and drains nearly 1,500 square miles. Counties within the subwatershed include Newton, Kankakee, Benton, Iroquois, Vermilion, and Ford (Figure 20). Cities within the Lower Iroquois subwatershed include Morocco, Fowler, Milford, Watseka, Onarga, Gilman, Clifton, Chebanse, St. Anne, and Kankakee.

Table 41 shows that approximately 87 percent of the land is devoted to agriculture, followed by developed land (7%) and forested land (3%).

Table 41. Land Use/Land Cover in the Lower Iroquois Subwatershed

Land Use/Land Cover	Watershed		
	Area		Percent
	Acres	Square Miles	
Agricultural Land	806,253	1,260	86.93
Developed Land	64,735	101	6.98
Forested Land	27,941	44	3.01
Pasture/Hay	16,598	26	1.79
Wetland	6,222	10	0.67
Open Water	3,178	5	0.34
Grassland and Shrubs	2,545	4	0.27
Total	927,473	1,449	100



4.5.1 Point Sources

This section summarizes the potential point sources in the Lower Iroquois subwatershed.

4.5.1.1 Wastewater Treatment Plants (WWTPs) and Industrial Facilities

There are 14 NPDES facilities that are permitted to discharge bacteria in the Lower Iroquois subwatershed (Table 42 and Figure 21). Among them, Watseka is the largest facility with a design flow of 1.6 MGD.

In Illinois a number of WWTPs, including most of those identified in Table 42, have applied for and received disinfection exemptions which allow a facility to discharge wastewater without disinfection. Facilities with year-round disinfection exemptions may be required to provide IEPA with updated information to demonstrate compliance with these requirements and facilities directly discharging into a fecal-impaired segment may have their year-round disinfection exemption revoked through future NPDES permitting actions. Maximum design flows for Illinois NPDES facilities are also listed since they were used to determine allocations at high and moist flows.

Table 42. NPDES Facilities in the Lower Iroquois Subwatershed

HUC 10	HUC 10 Name	Permit Number	Facility Name	Receiving Stream	Average Design Flow (MGD)	Maximum Design Flow (MGD)	Exemption Status
712000213	Beaver Creek	IN0060798	Morocco WWTP	Iroquois River Via Beaver Creek	0.1500		None
712000206	Mud Creek	IL0042391	Cissna Park STP	Pigeon Creek	0.1000	0.2500	Year Round
		ILG580122	Rankin STP	Sugar Creek Via Whisky Creek	0.0800	0.3040	Year Round
712000207	Sugar Creek	IL0023272	Milford STP	Sugar Creek	0.2000	1.3000	Year Round
712000208	Spring Creek	IL0025062	Gilman-North STP	Glenn Ditch-Spring-Iroquois-Kankakee	0.5000	1.1500	Year Round
		IL0076813	Onarga STP	Drainage Tile To Spring Creek	0.2500	0.8780	Year Round
		ILG551072	Il Dot-I-57 Iroquois County	Iroquois R Via Spring Creek	0.0162	0.0405	Year Round
712000209	Prairie Creek	IL0037397	Prairieview Luthern Home	Unnamed Trib To Prairie Creek	0.0120	0.0300	Year Round
		IL0065358	Swissland Packing Company	Unnamed Creek Trib To Prairie Creek	0.0280	N/A	None
		ILG551007	Merkle-Knipprath Nursing Home	Iroquois R Via Langan Creek	0.0150	0.0375	Year Round
712000210	Gofield Creek-Iroquois River	IL0022161	Watseka STP		1.6000	4.0000	None
712000212	Langan Creek	IL0037206	Central Hs&Nash Middle School		0.0100	0.0260	Year Round
		IL0047040	Iroquois Mobile Estates		0.0100	0.0250	Year Round
		IL0049573	Clifton STP		0.2000	0.5000	Year Round
			Total		3.1712	7.6600	

4.5.1.2 Combined Sewer Overflows (CSOs)

There are two CSO communities (Watseka and Milford) with a total of 16 CSO outfalls in the Lower Iroquois subwatershed (Table 43 and Figure 21).

Table 43. CSOs in the Lower Iroquois Subwatershed

HUC 10	HUC 10 Name	Permit #	Facility	Outfall #	Pipe Description	Receiving Stream
712000207	Sugar Creek	IL0023272	Milford STP	20	CSO-150 Yds Downstream Chicago St.	Sugar Creek
				30	CSO-West Side	Sugar Creek
				40	CSO-Far West Side	Sugar Creek
				50	CSO-Southeast Side	Sugar Creek
				60	CSO-Kay Street	Kankakee River
				A040	CSO-Mulberry St(Gravity Flow)	Sugar Creek
				B010	CSO-Sewer Treatment Plant CSO	Iroquois River
				B040	CSO-Mulberry St(Pumped Flow)	Sugar Creek
				20	CSO-Junction Box F	Iroquois River
				50	CSO-Maple Street	Sugar Creek
712000210	Gofield Creek-Iroquois River	IL0022161	Watseka STP	A040	CSO-Mulberry St(Gravity Flow)	Sugar Creek
				B040	CSO-Mulberry St(Pumped Flow)	Sugar Creek
				50	CSO-Maple Street	Sugar Creek
				60	CSO-Kay Street	Kankakee River
				B010	CSO-Sewer Treatment Plant	Iroquois River
				20	CSO-Junction Box F	Iroquois River

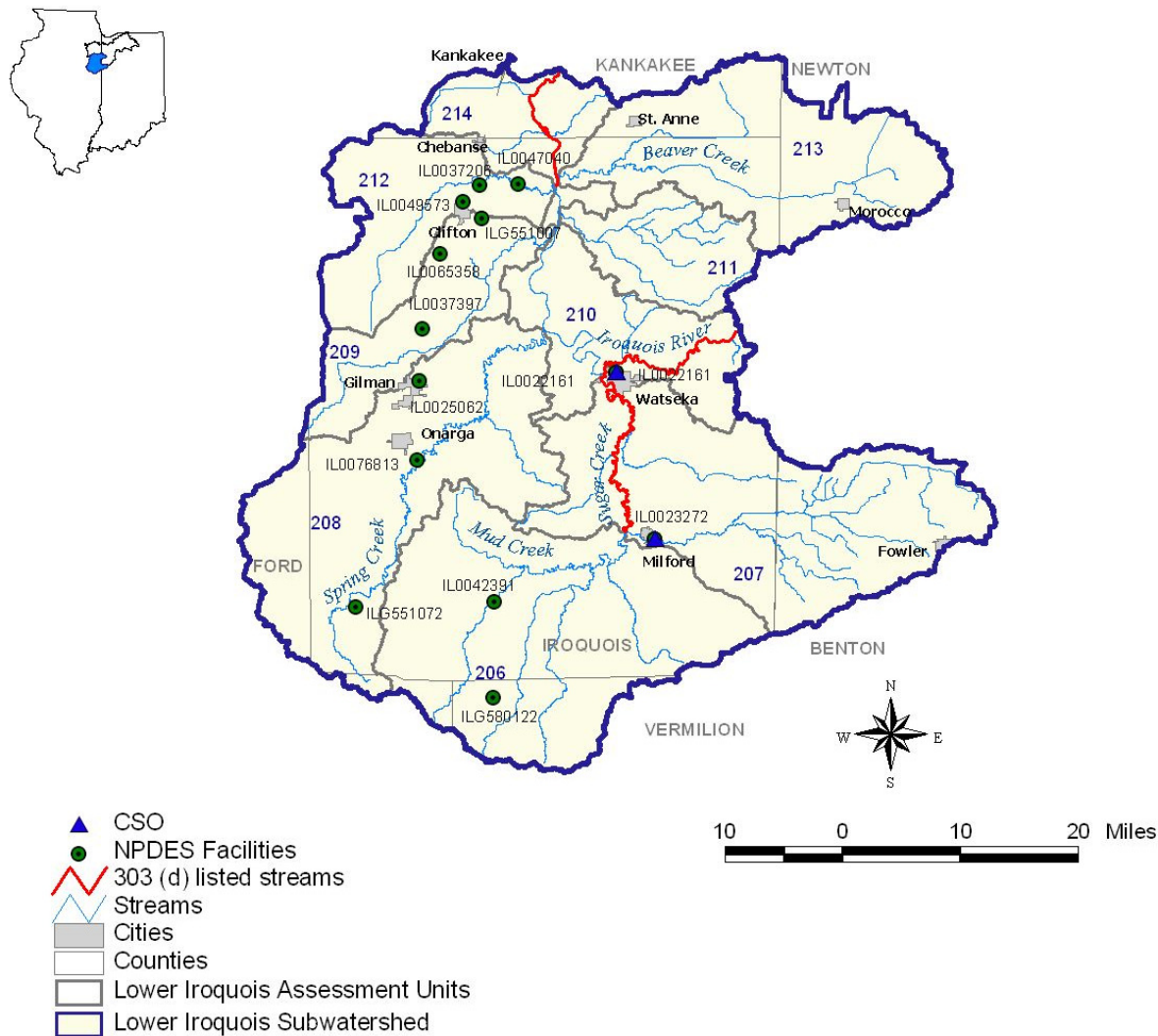


Figure 21. NPDES Facilities in the Lower Iroquois Subwatershed

4.5.1.3 Municipal Separate Storm Water Sewer System (MS4)

There are no MS4 communities lying solely within the Lower Iroquois subwatershed; however, small portions of the Kankakee and Kankakee County MS4s drain to this subwatershed (Table 44).

Table 44. MS4 Communities in the Lower Iroquois Subwatershed

MS4 Facility Permit ID	MS4 Name	Area (square miles)
ILR400260	Kankakee County	0.1
ILR400363	City of Kankakee	0.1

4.5.1.4 Concentrated Animal Feeding Operations (CAFOs)

There is only one CAFO in the Lower Iroquois watershed as shown in Table 45 and Figure 22. Illinois CAFO information is not available to Illinois EPA at this time.

Table 45. CAFOs in the Lower Iroquois Subwatershed

Major Subwatershed	HUC 10	Watershed Name	NPDES ID	Operation Name
Lower Iroquois	712000213	Beaver Creek	ING803684	Storey Pork Farm

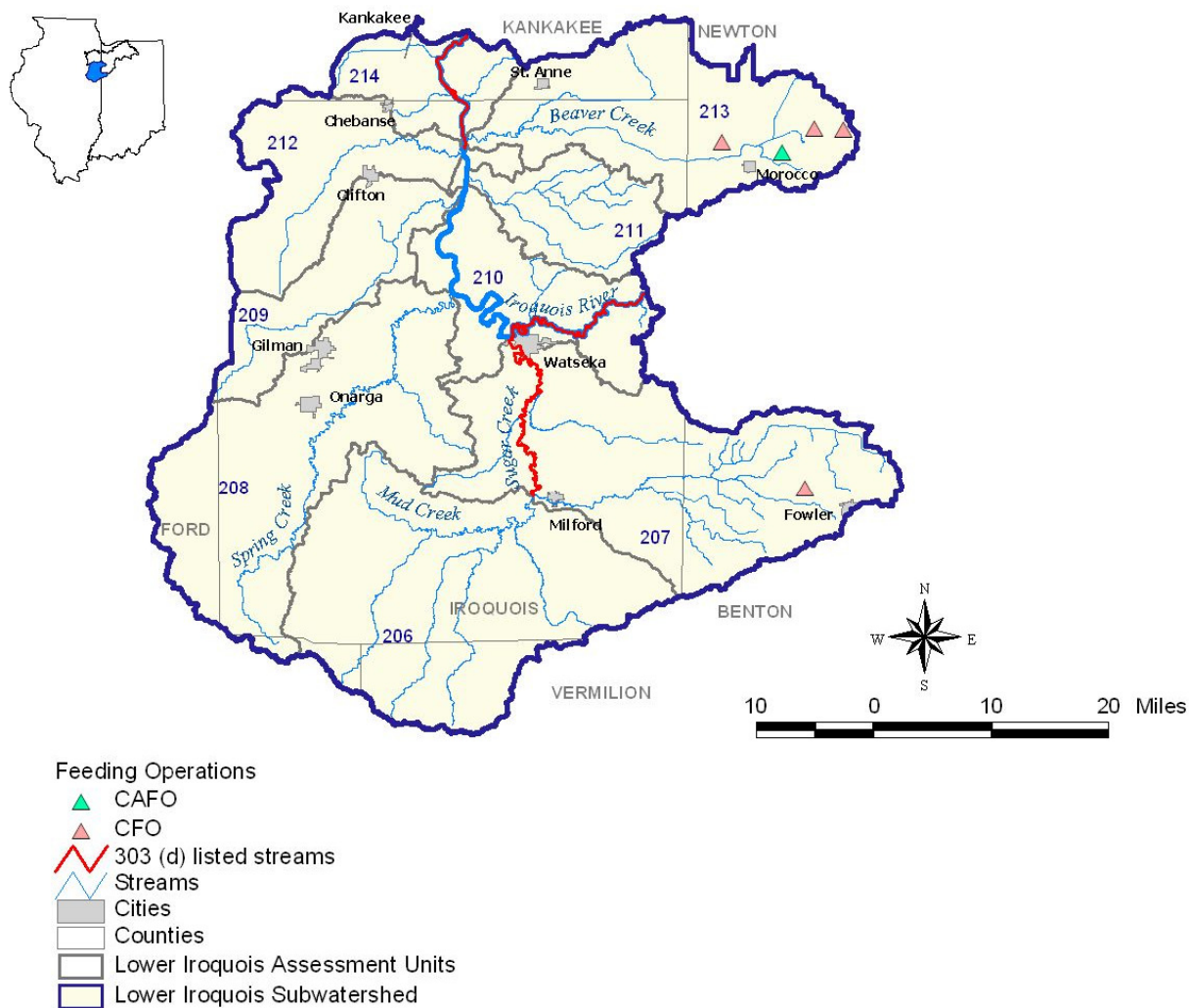


Figure 22. Feeding Operations in the Lower Iroquois Subwatershed

4.5.2 Nonpoint Sources

This section addresses the potential nonpoint sources of bacteria in the Lower Iroquois subwatershed.

4.5.2.1 Onsite Wastewater Treatment Systems

The rural population density in the Lower Iroquois subwatershed is only 22 persons per square mile, which is significantly less than that of the Upper, Middle, and Yellow River subwatersheds (Table 46). The majority (71 percent) of the subwatershed is comprised of soils with low infiltration capacity (A/D, B/D, C/D, and D). A and B soils cover 7 percent and 20 percent of the total subwatershed area, respectively.

Table 46. Rural Density in the Lower Iroquois Subwatershed

County	Area of County in Subwatershed (mi ²)	Estimated County Population in Subwatershed	Urban Population	Rural Population	Rural Population Density (persons/mi ²)
Vermilion	57.23	5,224	0	5,224	22
Iroquois	1040.20	27,509	18,654	8,855	
Ford	57.77	1,690	387	1,303	
Kankakee	94.25	15,199	1,212	13,987	
Newton	80.78	2,816	1,127	1,689	
Benton	119.78	2,668	1,671	997	
Total	1450.01	55,106	23,051	32,055	

4.5.2.2 Confined Animal Feeding Operations (CFOs) and Animal Feeding Operations (AFOs)

There are four CFOs in the Lower Iroquois watershed (Table 47 and Figure 22). The number of AFOs in the Illinois portion of the Lower Iroquois watershed is currently unavailable.

Table 47. CFOs in the Lower Iroquois Subwatershed

Major Subwatershed	HUC 10	HUC 10 Name	Farm ID	Operation Name
Lower Iroquois	0712000207	Sugar Creek	1178	Ewen Gravel Hill Farm
	0712000213	Beaver Creek	3277	C Bar C Farms
			3855	Gibson Fine Swine, Inc.
			2484	Sow Production Site

4.5.2.3 Livestock Population

Hogs, pigs, and cattle are the dominant livestock in the Lower Iroquois subwatershed and the subwatershed's animal unit density is 53 per square mile (Table 48). The approach used to estimate the number of animal units in the subwatershed is explained in Section 4.1.2.3.

Table 48. Animal Density in the Lower Iroquois Subwatershed

Subwatershed Area (sq. miles)	Animal	Number of Head	Number of Animals in One Animal Unit	Number of Animal Units	Animal Unit Density (per sq. mile)
1,450	Hogs and Pigs	94,776	2.5	37,910	53
	Cattle and Calves	37,934	1	37,934	
	Poultry	2,823	50	56	
	Sheep and Lambs	707	10	71	
	Horses and Ponies	178	0.5	356	
			Total	76,327	

4.5.2.4 Wildlife Population

The estimated deer density of the Lower Iroquois subwatershed is 3 deer per square mile (Table 49). The approach used to estimate the number of animal units in the subwatershed is explained in Section 4.1.2.4.

Table 49. Deer Density in the Lower Iroquois Subwatershed

Subwatershed Area (sq. mile)	County	Deer Population	Deer Density (per sq. mile)
1,450	Vermilion	2,481	3
	Iroquois	1,009	
	Ford	130	
	Kankakee	346	
	Newton	205	
	Benton	4	
	Total	4,175	

4.6 Lower Kankakee

The Lower Kankakee subwatershed lies almost entirely within Illinois and drains almost 834 square miles. Counties within the subwatershed include Will, Kankakee, Newton, Iroquois, Ford, and Grundy. Cities within the Lower Kankakee subwatershed include Herschel, Kankakee, Momence, Bradley, Bourbonnais, Manteno, Peotone, Beecher, Monee, Manhattan, Wilmington, and Lakewood Shores (Figure 23).

Similar to the rest of the Kankakee/Iroquois watershed, agriculture is the dominant land use in the Lower Kankakee subwatershed (Table 50).

Table 50. Land Use/Land Cover in the Lower Kankakee Subwatershed

Land Use/Land Cover	Watershed		
	Area		Percent
	Acres	Square Miles	
Agricultural Land	399,161	624	74.82
Developed Land	59,206	93	11.1
Forested Land	27,176	42	5.09
Grassland and Shrubs	21,417	33	4.01
Pasture/Hay	19,355	30	3.63
Open Water	5,933	9	1.11
Wetland	1,214	2	0.23
Total	533,460	834	100

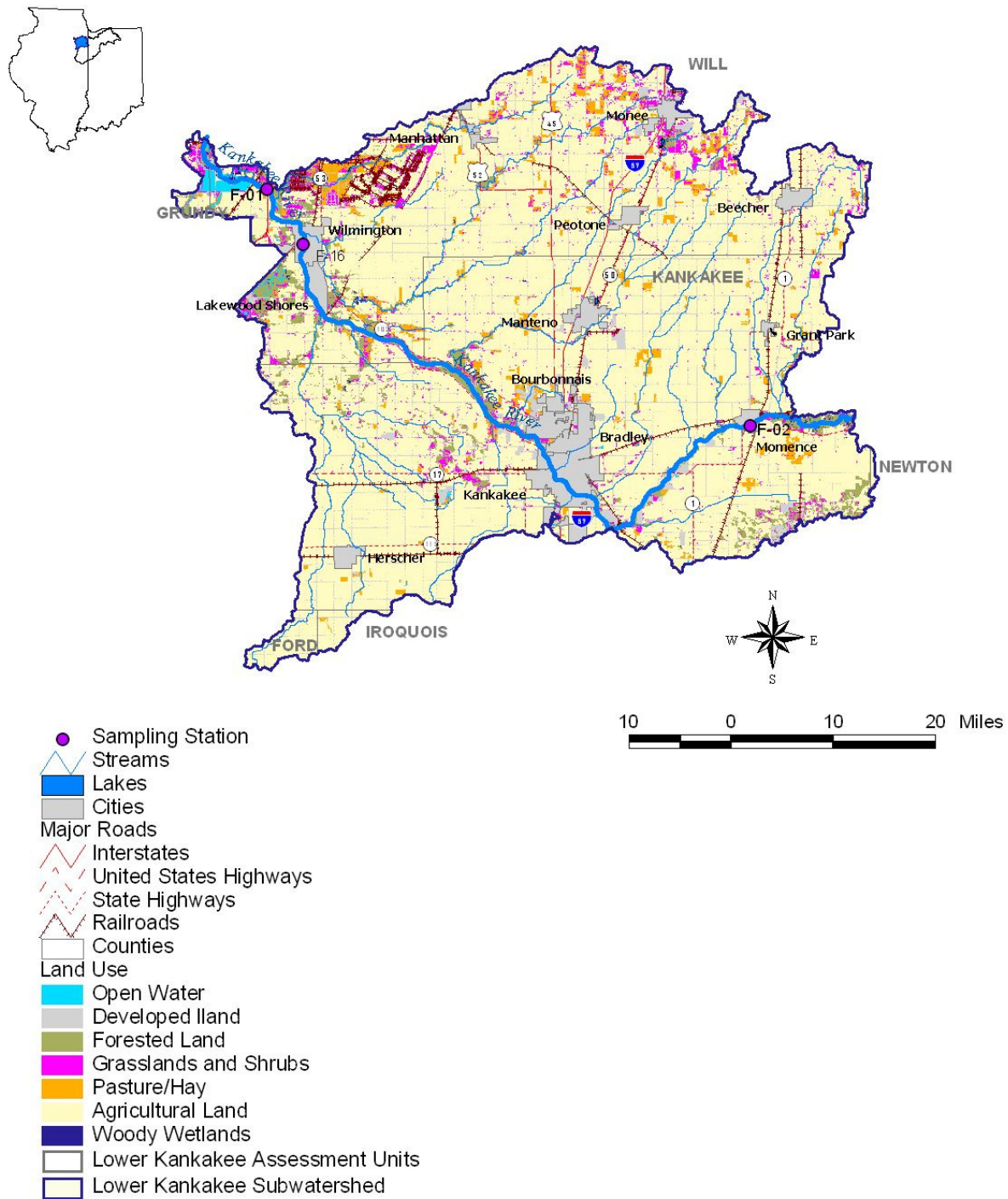


Figure 23. Land use in the Lower Kankakee Subwatershed

4.6.1 Point Sources

This section presents information about the potential point sources of bacteria in the Lower Kankakee subwatershed.

4.6.1.1 Wastewater Treatment Plants (WWTPs) and Industrial Facilities

There are 16 NPDES facilities that discharge bacteria to streams in the Lower Kankakee watershed. Eight facilities have year-round disinfection exemptions and five facilities have seasonal disinfection exemptions (November through April) as shown in Table 51 and Figure 24. The largest facility is the Kankakee River Metro Agency which has an average design flow of 25 MGD and a maximum design flow of 45 MGD.

Table 51. NPDES Facilities in the Lower Kankakee Subwatershed

HUC 10	HUC 10 Name	Permit Number	Facility Name	Receiving Stream	Average Design Flow (MGD)	Max Design Flow (MGD)	Exemption Status
712000114	Spring Creek-Kankakee River	IL0022179	Momence STP	Kankakee River	1.6000	3.10000	Seasonal
		IL0045501	Sun River Terrace STP	Kankakee River	0.0750	0.32400	Year Round
		IL0049522	Beecher STP	Trim Creek	0.6000	1.50000	Seasonal
		IL0050717	Grant Park STP		0.3500	0.94000	Year Round
712000115	Rock Creek	IL0025089	Manteno WPCC	Kankakee River Via South Branch Rock Creek	1.1500	3.50000	None
		IL0030627	Peotone WWTP	Kankakee R Via Black Walnut Creek	0.8500	2.59000	Year Round
		IL0032051	Il Dot-I57 Will Co Rest Area	Northwest Branch Rock Creek	0.2600	0.65000	Year Round
712000116	Horse Creek	IL0032832	Herscher STP	Kankakee R Via Horse Creek Via East Br Horse Creek	0.2500	0.87500	Year Round
		IL0076368	Essex STP	Kankakee River	0.1760	0.63900	Year Round
712000117	Forked Creek	IL0026085	Wilmington STP	Kankakee River	0.7500	1.87500	Seasonal

Table 51. NPDES Facilities in the Lower Kankakee Subwatershed

HUC 10	HUC 10 Name	Permit Number	Facility Name	Receiving Stream	Average Design Flow (MGD)	Max Design Flow (MGD)	Exemption Status
712000118	Kankakee River	IL0021784	Kankakee River Metro Agency	Kankakee River Metro Agency	25.0000	45.00000	Seasonal
		IL0038199	Manteno Mobile Home Park	Exline Slough	0.0210	0.042000	Year Round
		IL0048674	Raymond's Truck Plaza	Kankakee River	0.0060	0.012500	Year Round
		IL0048968	Il State Toll Hwy-Plaza 21 STP	Des Plaines River	0.0005	0.00125	None
		IL0049093	Il DNR-Kankakee River State Pike	Kankakee R Via Rock Creek	0.0033	0.00830	Seasonal
		IL0055492	Il DNR-Kankakee River State Pike	Kankakee R Via Rock Creek	0.0050	0.02000	None
			Total		31.096	61.07000	

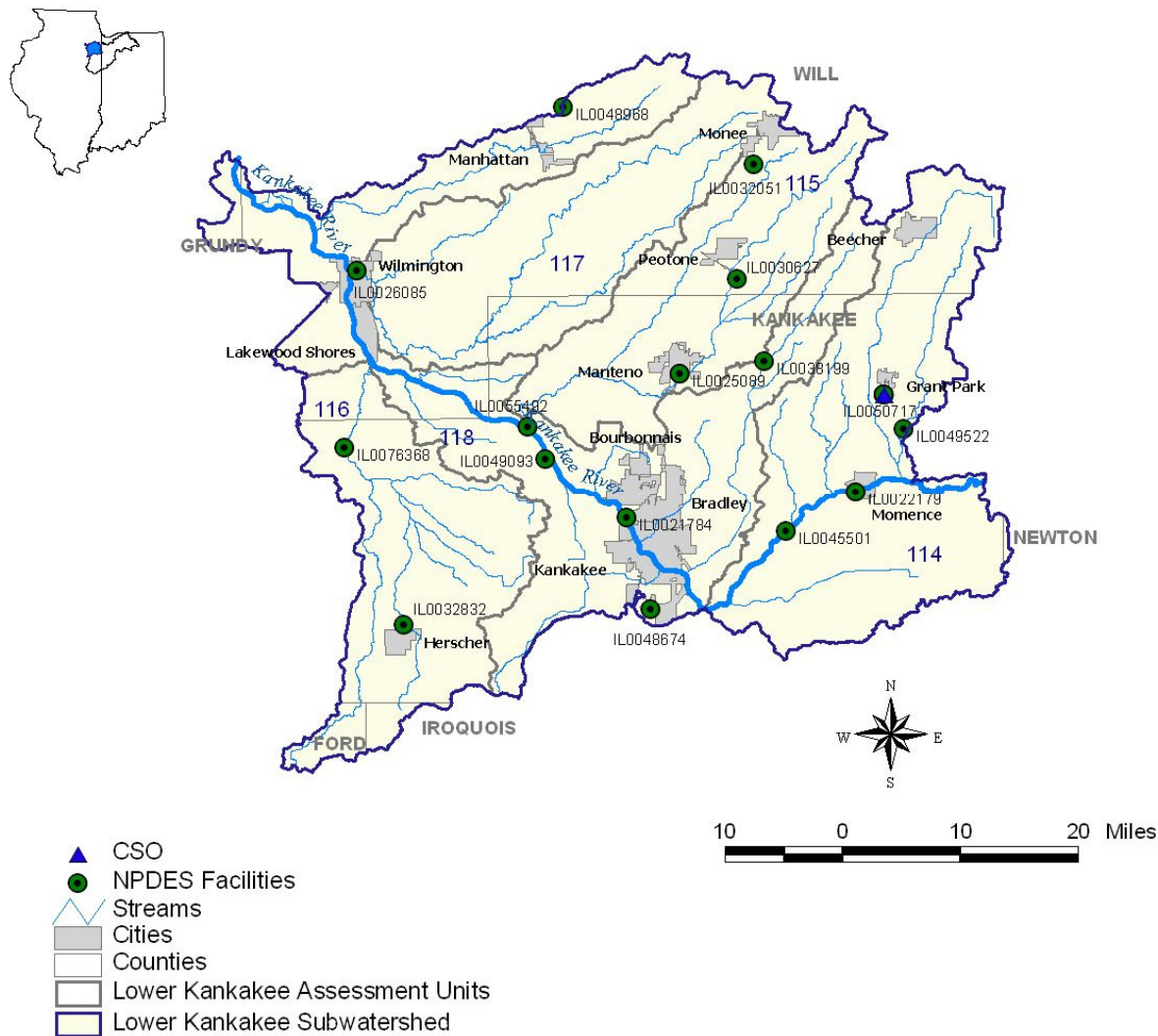


Figure 24. NPDES Facilities in the Lower Kankakee Subwatershed

4.6.1.2 Combined Sewer Systems (CSOs)

Grant Park in the Lower Kankakee subwatershed has 2 CSO outfalls as shown in Table 52 and Figure 24.

Table 52. CSOs in the Lower Kankakee Subwatershed

HUC 10	HUC 10 Name	Permit #	Facility	Outfall #	Pipe Description	Receiving Stream
712000114	Spring Creek-Kankakee River	IL0050717	Grant Park STP	B010	CSO-STP Bypass	Trim Creek
				A010	CSO-Raw Sewage Pump Station Overflow	Trim Creek

4.6.1.3 Municipal Separate Storm Sewer System (MS4)

There are seven MS4 communities in the Lower Kankakee subwatershed as shown in Table 53.

Table 53. MS4 Communities in the Lower Kankakee Subwatershed

MS4 Facility Permit ID	MS4 Name	Area (Square Miles)
ILR400015	Bourbonnais Township	2.0
ILR400260	Kankakee County	28.5
ILR400299	Village of Bourbonnais	12.0
ILR400300	Village of Bradley	19.0
ILR400363	City of Kankakee	29.0
ILR400495	Kankakee River Metropolitan Agency	93.0
ILR400619	Beecher Village	0.7

4.6.1.4 Concentrated Animal Feeding Operations (CAFOs)

There is currently no information available on CAFOs in the Lower Kankakee subwatershed

4.6.2 Nonpoint Sources

This section discusses potential nonpoint sources of bacteria in the Lower Kankakee Subwatershed.

4.6.2.1 Onsite Wastewater Treatment Systems

The estimated rural population density of the Lower Kankakee subwatershed is 310 persons per square mile, which is the second highest of the six subwatersheds (the density of the Middle Kankakee is 315 persons per square mile) (Table 54). Most (69%) of the soils have poor infiltration and are categorized as A/D, B/D, C/D, C, or D. A and B soils account for 31 percent of the subwatershed area.

Table 54. Rural Density in the Lower Kankakee Subwatershed

County	Area of County in Subwatershed (mi ²)	Estimated County Population in Subwatershed	Urban Population	Rural Population	Rural Population Density (persons/mi ²)
Iroquois	4.42	121	0	121	310
Ford	7.75	227	0	227	
Grundy	5.14	561	0	561	
Newton	0.71	25	0	25	
Will	333.22	266,046	16,939	251,989	
Kankakee	484.17	78,048	71,673	6,375	
Total	835.43	345,028	88,612	259,177	

4.6.2.2 Animal Feeding Operations (AFOs)

The number of AFOs in the Lower Kankakee watershed is currently unavailable.

4.6.2.3 Livestock Population

Swine and cattle comprise a majority of the farm animals in the Lower Kankakee subwatershed. The animal unit density of the subwatershed is 37 per square mile, which is the lowest of the six subwatersheds (Table 55).

Table 55. Animal Unit Density in the Lower Kankakee Subwatershed

Subwatershed Area sq. /miles	Animal	Number of Head	Number of Animals in One Animal Unit	Number of Animal Units	Animal Unit Density per sq. mile
834	Hogs and Pigs	41,908	2.5	16,763	37
	Cattle and Calves	11,304	1	11,304	
	Poultry	1,654	50	33	
	Sheep and Lambs	35	10	4	
	Horses and Ponies	1,462	0.5	2,924	
			Total	31,028	

4.6.2.4 Wildlife

Among the six subwatersheds, Lower Kankakee has the highest deer density at six per square mile (Table 56).

Table 56. Deer Density in the Lower Kankakee Subwatershed

Subwatershed Area sq. miles	County	Deer Population	Deer Density per/sq. mile
834	Iroquois	427	6
	Ford	17	
	Grundy	2,458	
	Newton	48	
	Will	1,777	
	Kankakee	2	
	Total	4,729	